VOL. VII NEW SERIES No. 2

FEBRUARY, 1898

THE OPHTHALMIC RECORD

EDITED BY

CASEY A. WOOD, M. D.
Chicago
G. C. SAVAGE, M. D.
Nashville
GEO. E. DE SCHWEINITZ, M.D.
Philadelphia
JOHN E. WEEKS, M. D.
New York
F. C. HOTZ, M. D.
Chicago
H. V. WÜRDEMANN, M. D.
Milwaukee
W. E. HOPKINS, M. D.
San Francisco
HAROLD GIFFORD, M. D.
Omaha

T. A. WOODRUFF, M. D.
EDITORIAL SECRETARY,
1102 RELIANCE BUILDING, CHICAGO, ILLS.

PUBLISHED MONTHLY

SUBSCRIPTION RATES: IN THE UNITED STATES, CANADA AND MEXICO, $3.00 PER ANNUM, IN ADVANCE. OTHER COUNTRIES OF THE POSTAL UNION, 14 SHILLINGS

THE OPHTHALMIC RECORD
SUITE 3, THE HIGH BUILDING, CHICAGO, U. S. A.

Entered at the Chicago Post-Office as second-class matter

R. R. Donnelley & Sons Co. Printers, Chicago

COLLABORATORS.

The March number of the Ophthalmic Record will contain among others an original contribution by H. Gradle, M.D., "Tarsitis;" one by Casey A. Wood, M.D., "Primary Sarcoma of the Lid;" one by H. Moulton, M.D., "Dermoid Cyst of the Orbit;" one by D. Stevenson, M.D., "Dr. Savage's Direction Theory," etc., etc.

The Record particularly desires short practical papers on any subject connected with Ophthalmology. These will be published at as early a date as possible. It is understood that, unless otherwise arranged, original articles when accepted are contributed to the Record exclusively. Illustrative cuts will be made at the expense of the journal and proofs for correction will be sent to authors when desired. Reprints with covers are furnished at cost. One hundred of these will be presented to authors *gratis* when a request for them is written on the original manuscript. The Record will be issued monthly and each number will contain about 54 pages of reading matter.

Address all communications relating to Editorial Department to

T. A. WOODRUFF, M.D., Editorial Secretary,
1102 Reliance Bldg., Chicago.

Subscriptions and advertisements should be sent to the publisher, Suite 3, The High Bldg., Chicago, Ill., U. S. A.

TABLE OF CONTENTS.

I. ORIGINAL ARTICLES.

II. EDITORIALS.

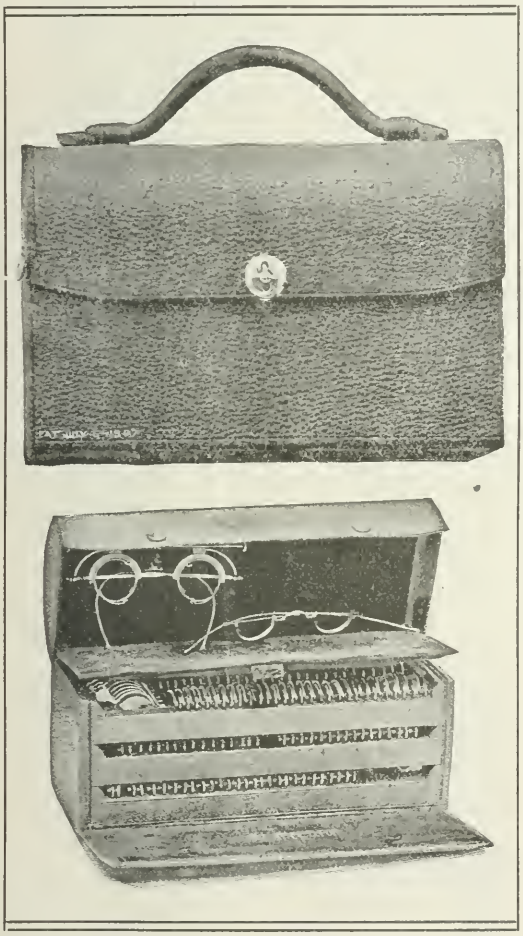
III. REPORTS OF SOCIETIES.

IV. TRANSLATION.

V. NEWS ITEMS.

....The....

"Geneva Traveler"



Makes its first bow to the Trade as a new departure in the line of Trial Cases. It is a regular little gem, so to speak. Its strong points are compactness, completeness and practical usefulness. It consists of three removable trays, one of which contains spherical cvx. lenses, another contains spherical cve. lenses, and still another contains cylinder lenses color disks, and prisms. The flap contains space for trial frames, ophthalmoscope and retinoscope.

We are making this case in three sizes, to contain either 1⅛, 1¼ or 1½ inch lenses; price complete **$53,** less 6 per cent. for cash. The price of this case empty is **$15,** less 6 per cent for cash.

Geneva Optical Co.

67 Washington Street

CHICAGO

OWING to numerous inquiries for the 1897 volume, as well as for odd numbers of the OPHTHALMIC RECORD we announce the following: Volumes I to V may be had by addressing G. C. Savage, M. D., 710 Church Street, Nashville, Tenn. The price of each of these volumes is $2.00. Of volume VI the price of single numbers, as long as they last, will be 50 cents each. The full volume will be sent, prepaid, to any address for $5.00 cash. Very few of the complete sets are left. The January and April numbers are out of print. Single numbers of 1898 volume, 35 cents. Address the

OPHTHALMIC RECORD

Suite 3.....The High Building.....Chicago

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, FEBRUARY, 1898. NO. 2. NEW SERIES

ORIGINAL ARTICLES.

REMOVAL OF THE CLEAR CRYSTALLINE LENS FOR HIGH MYOPIA.*

BY EDWARD JACKSON, A.M., M.D.

Professor of Diseases of the Eye in the Philadelphia Polyclinic, Surgeon to Wills' Eye Hospital.

PHILADELPHIA.

The patient presented this evening P. S., aged 24, laborer, applied at Wills' Hospital, April 3d, 1897, seeking to have his sight improved by operation. He felt that his vision was so poor as to largely disqualify him for manual labor, and he had never been able to get glasses that were satisfactory; neither was he satisfied with the correcting lenses when we tried them on him.

The right cornea presented near its center an oval facet 3½ mm. long by 2½ mm. wide, slightly hazy, through which could be seen the details of the fundus, with a strong convex lens, the hyperopia amounting to 15 D., while the refraction of other portions of the pupil was myopic about the same amount. The disk was red and hazy, with a crescent of sclera one-half its width extending around it. The choroid was generally thinned. The crystalline lens was clear, no vitreous opacities were noticed.

The left eye showed higher myopia and a large, irregular area of choroidal atrophy surrounding the disk, extending equally to the nasal side, with black patches of pigment. The lens and vitreous were clear, as in the other eye. The determination of the refraction with the ophthalmometer was unsatisfactory. The note made being, "Refraction 45 D. with irregular astigmatism." By skiascopy and the test lenses we found:

R. — 13.50 ⌒ — 3.25 cyl. ax 55° V. = $\frac{5}{80}$ths.

L. — 18.50 ⌒ — 1.50 cyl. ax. 100° V. = $\frac{5}{55}$ths—1.

*Read before the section on ophthalmology of the College of Physicians of Philadelphia, Dec. 21st, 1897.

April 6th, after the plan of Fukala, a free crucial incision was made in the lens of the left eye, extending into the nucleus. It was followed by prompt swelling and opacity of the lens, a pericorneal zone of hyperemia, and the filling of the anterior chamber with lens matter.

April 13th. The inflammatory reaction was severe and the eye becoming painful, but the tension was normal. A linear incision was made with the keratome and the lens matter extruded by pressure and washed out with Lippincott's syringe. For many weeks the eye remained hyperemic and very irritable. Division of the posterior capsule revealed decided haziness and opacities of the vitreous, which cleared slowly.

July 15th. With correcting lens $+ 2.50 \supset + 2$ cyl. ax. 160° the left eye had gained vision of $\frac{5}{5}$ths. Up to that time its vision with the best correcting lens had continued distinctly worse than it was with the correcting lenses before the operation.

September 28th. The crystalline was opened in the right eye by a small cut in the capsule with the free division of the nucleus. Two days later there was marked opacity of the nucleus and radiating in all directions from it, as perfect a star as I have seen in connection with posterior polar cataract.

October 12th. The lens was becoming generally hazy, one small piece of lens substance had fallen to the bottom of the anterior chamber. The iris was pressed against the cornea by the swelling of the upper portion of the lens, and within the last two days some pericorneal redness had developed. The ophthalmometer showed corneal astigmatism 2.5 D. ax. 160°. A corneal incision was made about parallel to the meridian of least curvature of the cornea, 60° or 70°. The nucleus and two-thirds of the cortex was removed, again using Lippincott's syringe to wash out the anterior chamber. After this the eye quickly became normal, and the subsequent division of the capsule and remaining cortex gave a clear pupil. With correcting lenses:

R. $+ 2.50 \supset + 2$. cyl. ax. 75° V. $= \frac{5}{5}$ths.

L. $+ 2. \supset + 2$. cyl. ax. 160° V. $= \frac{5}{5}$ths.

Many hundreds of cases of removal of the clear crystalline lens for high myopia have been reported in Europe, particularly in Germany. But so far as I can now recall no case like the above has been reported in this country.

In the paper of Herbert Harlan, entitled "Contribution to the Question of Removal of Lens in Myopia" (*Trans. Section on Ophthalmol. Amer. Med. Assoc.* 1896) are reported a case of removal of the clear lens which had been dislocated into the anterior chamber by a blow, and one of the accidental removal of the lens many years previously.

Alt's case reported in *The American Journal of Ophthalmology* for June, 1895, was one in which the lenses had become so far dislocated that the upper margin was just seen in the undilated pupil.

Most operators have from time to time removed unripe cataracts, and as the choroidal cataracts of highly myopic eyes mature very slowly, and are not very well suited to ripening operations, it has sometimes hap-

pened that such unripe cataracts were removed from highly myopic eyes. Thus in a patient from whom I extracted the crystalline lens at the Philadelphia Polyclinic, October, 1893, the vision prior to operation was $\frac{4}{1\frac{1}{2}0}$ths, and the refraction of the eye after operation was a mixed astigmatism, the correction of which gave vision of $\frac{4}{2\frac{1}{5}}$ths. But such cases are not cases of removal of the clear lens for high myopia.

In view of the readiness of surgeons in this country to take up new operations there must be some special reason for their neglect of this procedure. Probably, it is partly because high myopia has been more generally relieved by lenses here than abroad. Certainly the statements made that patients can never wear lenses of more than 13 or 15 D. with satisfaction is disproved by our practical experience. In a paper read before the *Philadelphia County Medical Society* June 8th, 1897, I called attention to the fact that higher degrees of myopia can frequently be corrected by lenses, and reported several cases of the kind.

Then, too, the reports regarding the results of removal of the crystalline published in Germany bore upon the face evidences of inaccuracy. For instance, Von Hippel in reporting a series of 114 removals of the clear lens for high myopia, gave what purported to be the refraction of these eyes before the operation, and for only two of the eyes was astigmatism mentioned. No one who has done much at the accurate measurement of myopia can be made to believe that such statistics represent at all accurately the actual refraction of the eyes operated on. No such series of high myopias without astigmatism could be found. And while the accurate determination of the refraction prior to operation may not have been of great importance to the patient, the failure to make such accurate determination greatly detracts from the scientific value of such reports. Without determination and correction of the astigmatism, determination of the acuteness of vision was, of course, impossible ; and all statements regarding the improvement of vision by operation, when based on such statistics, must be regarded with grave suspicion. Such glaring inaccuracies and looseness of statement certainly did not tend to advance the views with which they were associated, and which were in direct opposition to the positive opinions of the great authorities of ophthalmology.

When Mooren first reported his cases at Heidelberg in 1858, Graefe strongly opposed such a procedure. Donders said (*Accommodation and Refraction of the Eye*, page 416) "When in a case of highly myopic structure of an eye, a lens affected with cataract has been successfully extracted, and a nearly emmetropic condition has been obtained, the operator has been exposed to the temptation of endeavoring, by the abstraction of a

normal lens, to remove the myopia. A patient who was an amateur in dioptrics, endeavored to induce me to perform this operation.

"But I need not say, that such a momentous undertaking, doubly dangerous where a myopic eye and a transparent lens are concerned, without that, even in the most favorable cases, any real advantage is to be expected, would exhibit culpable rashness. Not only would the staphyloma posticum continue equally threatening, but we should also have sacrificed the accommodation — an advantage which that of somewhat larger images than would be obtainable by neutralizing glasses, could by no means counterbalance."

In spite, however, of the disrepute into which the weight of its opponents, and the loose assertions of some of its friends have been calculated to bring it, I believe that the removal of the clear crystalline lens for high myopia is a real addition to surgical therapeutics, fully justified and demanded in certain cases. How numerous these cases are, and just the extent and nature of the benefits to be conferred by it, are still to be determined. To aid in that determination, and in the selection of cases for which it is appropriate, certain questions as to the effects of operation need to be discussed; and all cases on which it is tried should be fully reported.

In the first place, among the papers upon the subject emanating from German operators, it seems strange that there has been no intelligent discussion of the optical effect of the operation. So far as I know, it is only in a paper by Percival (*Archives of Ophthalmology*, 1897, p. 1) that it is incidentally brought out. Every one at all acquainted with the subject knows that the removal of the crystalline lens will diminish high myopia. But, so far as I know, no one has yet pointed out to just what extent we should expect the refraction to be changed by the operation. Even our authorities on the subject of refraction have unwittingly obscured this question instead of throwing light upon it. Helmholtz while discussing the refraction of the aphakic eye does not, in his *Handbuch der Physiologischen Optik*, take up the special question of the effect produced by removal of the lens in high myopia, and its difference from the effect (as measured at the cornea) produced in emmetropic or hyperopic eyes.

Donders (*Accommodation and Refraction of the Eye*, p. 312,) makes only this allusion to it, "A case even occurred to me, in which the accuracy of vision of distant objects was incapable of improvement by either positive or negative glasses. In this instance, the visual axis of the eye, emmetropic with aphakia, had actually a length of rather more than

30mm.; and we may assume that so long as the crystalline lens was still present, myopia of about ⅓ (inch) had existed."

Landolt (*Refraction and Accommodation of the Eye* p. 414) is more definite and more misleading. He says, "The only eyes that do not become hyperopic upon losing the crystalline lens, are those which are myopic 11 D. or more, i.e., eyes which before this loss, already have at least 11 D. of refraction in excess. The removal of the crystalline will render a myope of 11 D. exactly emmetropic while myopia of 20 D. would be changed by it into a myopia of 20.–11.=9 D."

It is interesting to compare the above statement with Landolt's own figures in other portions of his book. Thus (page 79), he makes the second focal distance of the cornea 31.095mm. That is the distance the retina must lie behind the summit of the cornea to have parallel rays accurately focused upon it by the refraction of the cornea alone. And on page 140, he gives the antero-posterior length of an eyeball having 18 D. of myopia as 30.85mm. and of one having 19 D. of myopia as 31.47mm. That is an eye having 18.5 D. of myopia would be just sufficiently elongated to be rendered emmetropic by removal of the crystalline lens, to have parallel rays focused on the retina by the average refraction of the cornea.

This existing uncertainty in the literature of the subject, justifies us in going somewhat into detail with regard to the optical effect of removal of the crystalline lens. The determination of this is important in every case for which removal of the clear crystalline is to be considered. While neither very difficult or tedious such determination is not materially helped by either the schematic eye of Listing, or the reduced eye of Donders and others. These deal with the refraction of a single system, the reduced eye with the refraction of a single surface, the schematic eye with the refraction at three surfaces, but reduced to a single set of cardinal points.

In the problem before us, we have to do with the refraction of two different refractive systems, those of the cornea and the crystalline lens, situated some distance apart; and with the effect of subtraction of one of these refractive systems. Since problems of this sort have become of actual importance in practice in connection with removal of the clear lens for myopia, it seems proper to introduce for their convenient solution, still another conception of the refraction occurring within the eye.

I propose that we regard the refraction of the eye as produced by two infinitely thin lenses, the one situated at the summit of the cornea having a focal distance of 31.mm., about equal that of the cornea (refractive

power equal to about 32.25 D.), the other lens situated 6 mm. back of the summit of the cornea, having a focal distance of 50 mm. (refractive power of 20 D.) Such a scheme might be called a *dioptric eye*. The accuracy with which it represents the average human eye may be seen by comparing these dimensions with those adopted by Helmholtz (*Handbuch der Physiologischen Optik*) in his earlier studies of the subject, and with those preferred in his later work. It will be noticed that the first and second principal points of the crystalline lens really lie within one-fifth of a millimetre of each other, and so nearly 6mm. behind the cornea, that the conception of refraction by the lens at a single principal plane at 6mm. behind the cornea does no violence to the facts.

TABLE.

	Dioptric Eye.	Helmholtz, earlier.	Helmholtz, later.
Focal distance of cornea	31.	31.692	31.095
Focal distance of crystalline	50.	43.707	50.617
Depth of crystalline behind cornea	6.	-----	-----
Depth of anterior principal point of crystalline	-----	5.707	5.726
Depth of posterior principal point of crystalline	-----	5.936	5.924
Length of eyeball	22.667	22.231	22.819
Refracting power of cornea	32.26	31.36	32.16
Refracting power of crystalline	20.	22.88	19.75
Total refractive power of eye	44.12	44.90	43.82

The value of this conception of the dioptric eye will appear as we work out the actual change produced in different cases by removal of the second refracting element, the crystalline. In the normal emmetropic eye the rays which struck the cornea parallel reach the second lens, the crystalline, converging to a point 31. mm.—6=25 mm. behind it. They reach the crystalline, then 40 D. convergent. To this is added 20 D., the converging effect of the crystalline, making 60 D. The rays are, therefore, focused 1000÷60=16.667 mm. behind the crystalline. 16.667+6=22.667, the antero-posterior axis of the emmetropic eye. If we remove the crystalline lens and replace its effect by adding to the refractive power of the cornea, the refractive power required to be so added is the strength of a convex lens correcting the hyperopia caused by rendering a previously emmetropic eye aphakic. After removal of the crystalline, the cornea would require to have a strength of 1000÷22.667, equal 44.12 D. 44.12 D.—32.26, the refraction of the normal cornea, equals 11.86 D., the hyperopia *measured at the cornea* produced by extraction of the crystalline from the emmetropic eye. To correct this hyperopia the lens placed at the ordinary distance of a lens in front of the eye would be a convex 10.5 D.

In contrast to the above, let us use the dioptric eye to ascertain the amount of previous myopia necessary for the removal of the crystalline lens to render the eye emmetropic. To give emmetropia after removal the retina must lie 31 mm. behind the cornea. To be focused upon the retina, rays must leave the crystalline converging towards the point 25 mm. behind the crystalline; that is 40 D. convergent. If they must be rendered 40 D. convergent by the crystalline and its refractive power is 20 D. they must have been 40 − 20 = 20 D. convergent when they fell upon the crystalline. They must have been converging towards a point 1000 ÷ 20 = 50 mm. behind the crystalline, which will be 50 + 6 = 56 mm. behind the cornea. Such rays must have left the cornea convergent 1000 ÷ 56 = 17.86 D. convergent. If they are rendered thus convergent by the cornea having a refractive power of 32.26 D., they must have been divergent on reaching the cornea, to the extent of 32.26 — 17.86 = 14.40 D.; that is, the myopia before removal of the crystalline lens which would give an emmetropic eye after removal of the crystalline lens is 14.40 D. *as measured at the cornea.* Such a myopia would be corrected by concave lenses of 17. or 18. D. placed the ordinary distance in front of the cornea. This, then, is the amount of myopia as ordinarily measured and expressed, that can be corrected by removal of the crystalline.

The next problem of importance is the effect of removal of the crystalline on the size of the retinal image. This has been repeatedly worked out by previous writers on the subject. A sufficiently accurate approximation for practical purposes, may be reached by considering the effect of the increased length of the eyeball antero-posteriorly as compared with the reduced eye of Donders. In the emmetropic reduced eye the nodal point is 15 mm. in front of the retina. In the eye so myopic as to be rendered emmetropic by removal of the crystalline the nodal point is the same distance behind the cornea, and the increased length of the eyeball is to be added to 15 mm. to find its distance in front of the retina. The latter eye being 31 mm. long, as against 22⅔ mm., the length of the normal emmetropic eye, the difference of 8⅓ mm. is to be added to 15, making the distance from the retina to the nodal point 23⅓ mm. Since, for a given object at a fixed distance, the size of the retinal image, is directly proportioned to the distance of the retina from the nodal point, the linear dimensions of the retinal image of such a myopic eye, will be to those of the emmetropic eye as 23⅓ is to 15. The retinal image of the myopic eye will be 55 per cent. larger than that of the emmetropic eye. The correction of myopia by concave lenses placed at the anterior focus of the eye, the position usually assumed for the correcting lens,

reduces the retinal image of the myopic eye to the size of the retinal image of the emmetropic eye. But the correction of myopia by removal of the crystalline, carrying the nodal point only from 7.321 to 7.829 behind the cornea, leaves the size of the retinal image practically unchanged. Hence, the gain in size of the retinal image by this latter means of correcting myopia is 55 per cent.; and this is about the improvement in visual acuteness that we can expect from a perfectly satisfactory removal of the crystalline lens, if the myopia is axial. If the myopia is myopia of curvature the gain will be less.

The ideal myopia, then, for correction by removal of the crystalline lens will be axial myopia, corrected by a concave lens of 17 or 18 D., and in such cases a perfect operative result should give 55 per cent. improvement of vision and escape from the need of wearing strong lenses. This may well carry the acuteness of vision, up from a point where a certain occupation is impossible, to a point where it is quite practicable. For patients who do only coarse manual labor the vision obtainable after removal of the crystalline without iridectomy, without any correcting lens, may be quite sufficient for their needs. Of course, accurate vision will usually still require correcting lenses, and different lenses for different distances.

One other point, the removal of the lens, rather than needling for absorption, has usually been practiced; and probably will continue to be. Even for patients young enough to make complete absorption by repeated needling possible, the long period required to accomplish absorption with safety will probably lead most surgeons to prefer removal. The incision for removal is sufficiently long to permanently alter, in most eyes, the curvature of the cornea. Therefore, it should be so placed as to tend to correct existing astigmatism or to utilize existing astigmatism to correct what it will cause. Despite Von Hippel's statistics, I believe that rather high astigmatism exists in a majority of cases of high myopia. Of course, after removal of the crystalline only the astigmatism of the cornea remains. Hence, the direction of the principal meridians of the cornea shown by the ophthalmometer, and not the direction of the principal meridians of the total astigmatism shown by the test lenses, are of practical importance in determining the location of the corneal incision.

CONCERNING CATARACT EXTRACTION—A REVIEW WITH COMMENTS.

BY G. E. DE SCHWEINITZ, M. D.
OF PHILADELPHIA.

The Corneal Section.—The disposition to make the incision exactly through the corneo-scleral junction, or through the transparent margin of the cornea, continues to be general, the height of the flap, or in other words, the extent of the corneal periphery which is included, varying according to the method of extraction which is adopted. It is generally conceded that for the proper expulsion of the lens in combined extraction, a flap embracing about one-fourth of the corneal periphery is sufficient. When the cataract is large, it is safer to include fully one-third of the corneal periphery. For the extraction of full-sized cataracts by the uncombined or simple method, the section may comprise nearly or even wholly the upper half of the cornea. Variations from these dimensions, however, are common, according to the experience and judgment of individual operators. Indeed, there can be no arbitrary rule—the probable size of the lens and the character of the cataract are the governing factors.

If, as Knapp has long advised, the knife remains in the same plane throughout, and the blade is turned neither forward nor backward at the completion of the section, a small *conjunctival flap* results, which is rather an advantage than otherwise. In Professor Snellen's operation the incision occupies half the circumference of the cornea, and lies in the apparent corneo-scleral margin. A large, broad conjunctival flap is made after the section of the corneo-scleral margin is completed. This conjunctival flap possesses several advantages: it conserves the vitality of the cornea, promotes healing, and prevents iris-prolapse. The procedure has been commended by Berry, Landolt and other operators, but, owing to the hemorrhage which sometimes follows the formation of conjunctival flaps, they have been condemned by so experienced an operator as J. A. White, of Richmond.

It will be remembered that the late Dr. Williams, of Boston, was accustomed to make a Lebrun incision, and to place a small suture in the apex of the flap. His son, Dr. C. H. Williams, after simple extraction,

when a small conjunctival flap remains, places in the flap one to three sutures. A strong advocate of suture after extraction is Kalt, in France. The reviewer is impressed with the value of a conjunctival flap, and although he has not used sutures to close the wound after extraction, he has placed them with advantage after excision of a prolapsed iris.

Capsulotomy.—Differences of opinion in regard to the best method of performing capsulotomy continue. It would seem that peripheral capsulotomy, as practised by Knapp, possesses the greatest advantages, if it is understood that needling of the capsule later on is a necessary procedure —is, in other words, as Knapp has stated, the final stage of cataract extraction. An opening by means of a central crucial incision possesses disadvantages, but these are not present if the incisions are made in the form of a T. Excision of the centre of the capsule with forceps is usually reserved for those cases in which there is manifest thickening of this membrane. Nevertheless, as is well known, the routine practice of capsulotomy with forceps is advocated by many experienced operators.

Choice of Operation.—The disposition to perform "simple extraction" continues to be very general, or perhaps the procedure has found more universal favor, although now and then an operator of experience has decided to return to the "combined method." There seems, however, to be a greater tendency to select cases, or, rather, to separate those suited to the operation with iridectomy from those suited to the operation without excision of a piece of the iris. To be sure, the old fear of prolapse of the iris, which for a time was the chief objection to simple extraction, is passing away. Indeed, Berry has gone so far as to state that iris-prolapse, if the operation is performed after the manner of Snellen, need not be considered. He is, as are most surgeons, however, careful to make an iridectomy if the iris does not at once undergo easy, spontaneous replacement, or if it is not readily replaceable by the ordinary methods.

It is interesting to note the character of cases selected for the combined method of extraction. Thus, Berry excludes from simple extraction cases of hard, nuclear, black cataract in old people and of overripe cataract with capsular opacities and disease of the suspensory ligament; also cases in which there is a very shallow anterior chamber, and in which there is a foreign body in the lens, or in which there are iritic adhesions. So, too, he prefers combined extraction in nervous and unruly patients. In addition to the cases catalogued by Dr. Berry, the reviewer considers those in which the ball is hard, the lens large, the iris is not readily dilatable, or where there is ciliary irritation and the cataract is not yet ripe, more suited to the combined than to the simple method.

Now and then reports of an attempted revival of the extraction of cataract in the capsule appear. For example, Gradenigo after section ruptures the zonula through its entire length with a small hook and then delivers the opaque lens.

Iris-Prolapse.—With reference to the treatment of prolapse of the iris as a complication of simple extraction of cataract, a good many surgeons follow Knapp's advice to cut off the prolapse and reduce the edges of the iris if it is discovered within a few hours after its occurrence; if it is not seen early, to allow it to remain until the eye is quiet, when, if there is staphylomatous bulging, the protrusion may be abscised, or, in other words, treated as a staphyloma of the cornea.

The conservative treatment of iris-prolapse, even when discovered early, however, is gaining ground, as may be inferred from the recent communication on this subject by Dr. Robert L. Randolph, Dr. Joseph A. White, and others. Under suitable bandaging the prolapse flattens out and operative interference seems rarely indicated. In the discussion just referred to, the doubtful value of eserine in restoring a prolapsed iris was emphasized, because, as Dr. Randolph points out, it is apt to heighten the condition of irritation and does not seem to have much power in pulling the iris into place. Atropine, on the other hand, does not increase the hernia and lessens irritation. It is taken for granted that a compress bandage is applied during the treatment.

Ripening Operations.—While the belief of Dr. John E. Weeks, expressed two years ago, that, "it will not be long before the artificial methods of ripening cataracts will be entirely abandoned," may not yet have been realized, it is safe to state that the practice of ripening cataracts, whether by discission, Förster's method, or the Boerne Bettman, or the White-Pooley operation, appears not to have gained favor with the profession. If patients will not wait for nature's method of ripening, it seems preferable to extract the unripe lens, and, if necessary, deal with remnants by secondary discission. Indeed, Elschnig believes that all senile cataracts in patients over fifty are readily removable, whatever the condition of nucleus and cortex, and he is ready to extract as soon as vision becomes too poor to permit the patient to follow his ordinary vocation.

It is desirable that more information should be available with reference to the duration of treatment and the visual acuity after the extraction of unripe cataract. Statistics thus far published are quite as favorable as those relating to ripe cataract. This information is particularly needed on account of the frequent advertisements in the public prints of

methods of absorbing cataracts employed by irregular practitioners. Patients naturally depressed by a period of semi-blindness are apt to be deluded by these advertisements into undergoing treatment, which, to put it mildly, is at least valueless.

Preliminary Iridectomy. From the very fact that preliminary iridectomy is usually recommended in cases where serious complications are apprehended, or where for any reason an extraction in one eye has terminated unfavorably, we may assume that there is a well-founded faith that this procedure improves the patient's chance of recovery. It would not be possible to discuss the advantages and disadvantages of preliminary iridectomy in this brief review, nor, indeed, is it necessary, as the whole subject has recently been considered very elaborately in the April number of the *Annals of Ophthalmology*, by Dr. W. Franklin Coleman who places himself on record, very decidedly, as believing that this is the safest method of extracting cataract, and one which should be commended to operators of limited experience.

After-Cataract (*Secondary Cataract*).—Except in rare instances in which the cataract is removed in the capsule, or in which a large piece of the anterior capsule has been removed with capsule forceps, sooner or later the division of the membrane is required if the highest type of visual success is to be obtained. Various modifications of the knife-needle continue to be used by most surgeons although a few, like Schweigger, have abandoned needles, or knife-needles of any description, and divide all so-called secondary cataracts with scissors introduced through a small wound made with a broad needle. Da Gama Pinto's very large experience with operations for the relief of secondary cataract indicates the value of a narrow Graefe cataract knife as an instrument for dividing the membrane. This surgeon, in addition to the ordinary operation of laceration of the capsule, has resorted to the so-called posterior discission in which the Graefe knife is passed through the sclera about eight millimetres behind the corneo-scleral junction. Recently Edward Jackson, arguing that the proper division of the membrane which remains after the extraction of cataract requires the longest possible sweep of the cutting edge of the instrument, advocates the entrance of the knife-needle through the limbus. He also believes that this method lessens the chance of infection. The writer uses Knapp's knife-needle with entire satisfaction; sometimes, when the membrane is thick, he has practised with a modified Hays knife-needle the so-called V-shaped iridotomy, as described by Dr. Lewis Ziegler, of Philadelphia.

Antisepsis.—The ordinary methods of sterilization of instruments have

not been greatly modified, and boiling water continues to hold its very proper pre-eminent place. It is possible that the recent suggestion made by E. A. de Schweinitz, of Washington, to utilize the vapor of formaldehyde for the purpose of sterilizing ophthalmic instruments, will prove to be valuable. Certainly the method would be a most convenient one.

It is so well known that neither irrigation nor the instillation of germicides produces sterility of the conjunctiva, that surgeons should strive, and do strive, to quote Knapp, to change the conjunctiva, if irritated or congested, into a pale, shining membrane by the simplest regimen. This regimen means that for some days preceding the operation the eye should be protected from anything which may produce hyperemia of the conjunctival vessels, because, as Randolph has expressed it, bacteria ordinarily non-pathogenic (and the normal conjunctiva always contains bacteria), may become harmful under certain favoring conditions, such as bruising the tissues by instruments, or irritating them with chemical substances. Whether all surgeons would be willing to follow Randolph in his advice to abandon conjunctival irrigation entirely, is doubtful. Flushing the conjunctival cul-de-sac with a non-irritating fluid like sterilized salt solution immediately preceding the operation, can at least do no harm in the sense of bruising the tissues, and may wash away irritating and contaminating secretions, and even, as has been experimentally shown, reduce the number and perhaps the vitality of the organisms which are present.

The evident conclusion of the matter is that strong germicidal solutions should not be used in the conjunctival cul-de-sac immediately preceding a cataract extraction, or after the corneal section, and to quote Randolph once more, in operating upon the normal conjunctiva, as in cataract extraction, the surgeon would do well to consider the subject of antisepsis and asepsis chiefly in connection with hands, instruments, cocaine and atropine. When the conjunctiva is not normal, as, for example, in cases of chronic conjunctivitis, lachrymal conjunctivitis associated with disease of the tear passages, blepharo-conjunctivitis, etc., methods of antisepsis necessarily must be more vigorous, or, rather operation must be deferred until the affected areas are brought into a reasonable state of health. It seems to the writer very essential in all of these cases to pay strict attention to the preliminary treatment of the rhinopharynx, from which, no doubt, many cases of infection have arisen.

EXTENSIVE LACERATION OF THE EYE BALL—RECOVERY WITH GOOD VISION—COMMENTS.

BY F. B. EATON, M. D.

SAN JOSÉ, CAL.

Illustrated.

The unusual amount of vision preserved in an eye which after injury was apparently demolished, and the surgical features of the treatment along some lines contrary to the conventional teachings of the text books, seem to warrant a report of the following case:

S. W. P., æt. 20, a blacksmith, was sent to me by his family physician, April 30, 1897. An hour before a piece of hot horse-shoe struck the left eye. It is shown in Figure 1 full size. The lower lid was slightly burned, and there was a wound of the globe extending from the center of the cornea downward and outward to include ¾-inch of the sclerotic. The wound gaped widely to the extent of about $\frac{3}{16}$ inch, and his companion stated that a large amount of "jelly-like stuff" had escaped; this extensive loss of vitreous was plainly shown bythe flaccid collapsed condition of the globe. A large portion of the iris, torn loose from the ciliary body, lay in the corneal wound. The lens was not visible.

According to traditional clinical rules this appeared to be a case for prompt enucleation, and my first impulse was to resort to it; but on second thought, as the piece of iron was very hot when it struck the eye, and so presumably aseptic, while the patient was temperate, young and healthy, I decided to attempt, at least, to save the eye-ball. Dr. Gordon, who saw the case with me, concurring. The conjunctival sac and parts about the eye were carefully cleansed, and under strict asepsis two fine sterilized silk sutures were inserted through the sclerotic, one at the junction of the middle and outer thirds of the wound, and the other close to the corneal limbus. The corneal wound still gaped, and the torn and prolapsed iris was carefully cut away. To bring the edges of the corneal wound together I next dissected up the conjunctiva for a distance of a third of an inch from the cornea, and with silk sutures brought the conjunctiva together so as to close the whole corneal wound.

An unfavorable prognosis was given, as about one-half of the vitreous was lost. However, on examining the eye on the third day there were no signs of reaction, and on the fifth day the wound was united throughout, there was no iritis, and there had been no pain; but an unfavorable prognosis was still given, as the lens was believed to have been dislocated backward, and the loss of

Figure I.

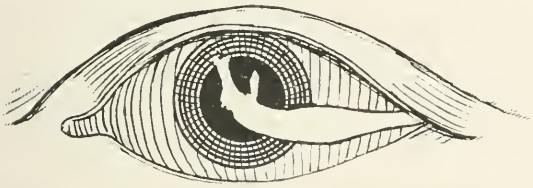


Figure II.

Figure III.

F. B. Eaton's Article on Extensive Laceration of Eyeball, etc.

vitreous so great. Atropine was used, and the pupil fully dilated; conjunctival sutures removed.

Seventh day—marked ciliary injection; no lens visible by oblique illumination; no prolapse of iris or ciliary body.

Tenth day—the suture on the corneal limbus came away.

From this time the case progressed rapidly on to recovery, and on the twenty-second day the injection had faded out. The examination showed an anterior synechia and double pupil; the false pupil being at the outer periphery of the iris. Tension normal.

Six weeks after the accident V = $\frac{20}{200}$ and with + 3.00ˢ⊃—6.00 cyl. axis 15° V⊃$\frac{20}{80}$.

On recent examination, December 8th, the eye appears as in Fig. 3; is free from all irritation or tenderness; tension normal; with + 1.25ˢ⊃—4.50 cyl. axis 180° V=$\frac{20}{40}$; and with + 4.00.ˢ⊃+4.00 cyl. axis 90, reads Jaeger No. 4 at eight inches; no accommodation. Iris of normal color; no retraction of scleral cicatrix. By oblique illumination the cornea is seen to be clear except at cicatrix. The lens is absent, but a concaved membrane, evidently the capsule, occupies the position of the posterior capsule. By the ophthalmoscope this membrane is seen to be thrown into folds which converge toward the anterior synechia near the inner limbus. Vitreous clear. Retinal vessels only visible here and there through the distorted cornea and capsule. Refraction at the macula+2.00ˢ.⊃—4.50 cyl., axis 180. Fig. 3 is a fair representation of the appearance of the eye as is possible by photography.

Remarks. With the exception of traumatic cataract, the injury presented every unfavorable feature possible; involving the cornea, expulsion of the lens, laceration of the ciliary body, extensive laceration of all three coats of the globe, and great loss of vitreous. Such laceration of the ciliary body alone, was, until of late years, considered sufficient indication for immediate enucleation, and yet one suture was passed through it apparently without detriment. As Buller of Montreal has pointed out: * "It is quite generally conceded, though recently denied by some ophthalmic surgeons, that wounds involving the ciliary region to any considerable extent are especially liable to be followed by sympathetic ophthalmia; and this part of the eye has received the ominous name of 'dangerous zone.' Antiseptic surgery has, however, certainly done much to diminish the supposed danger of wounds in this region."

Knapp has lately reported a case in some respects similar to the one here recorded. An exploding bottle inflicted a perforating wound in the upper part of the sclera, extending from near the equator of the globe on the temporal side obliquely forward into the ciliary region on the nasal side. Wound gaped and was filled with vitreous on the nasal and with

*Hare's System of Practical Therap., Vol. III, p. 1189.

ciliary processes on the temporal side. Lens and iris uninjured; sight preserved. The eye was kept closed with a compressive bandage, and the patient kept in bed for three weeks. No inflammation occurring, the only other treatment was a drop of atropine now and then, and the temporal two-thirds of the wound cicatrized, but the nasal portion, where the ciliary processes protruded, developed into an oblong cyst projecting 2 — 3mm. above the surface of the sclerotic; this was exsected by Knapp, and the edges of the scleral wound pared. Wound was not sutured, but left to unite under a simple compressive bandage. The eye made a good recovery, but with considerable astigmatism, and a dilated, immovable pupil. Nevertheless the result is surely a notable illustration of the value of conservative surgery in cases of extensive scleral wounds.

In the case here reported the paste-board eye shield of Dr. Harold Gifford was of invaluable service, as it has been in many cases of eye wound.

Porter Building.

AN IMPROVEMENT IN ILLUMINATING THE OPHTHALMOMETER.

BY WILLIAM E. BAXTER, M.D.

OF BOSTON, MASS.

After much experimenting with lights in various positions, with the view of finding a simpler method of illuminating the mires of the ophthalmometer, the writer has arrived at the following method, that for effectiveness and simplicity leaves little to be desired.

The method consists of fastening a sixteen candle-power electric lamp to the front of the arc, under the telescope and parallel to it,— the small frosted sixteen candle-power lamp, known to the trade as the "baby," is the most convenient — the lamp must be set on an insulated base. With the lamp in this position the mires are perfectly illuminated, and as the lamp revolves with the arc the illumination is the same in all positions. This enables one to do away with the large dial of the earlier instruments, the chief use of which was to furnish protection to the eyes of the surgeon, and makes a more compact and neater instrument. The light is shaded from the patient's eyes by means of a metal disc of six or seven centimeters in diameter, suspended from the end of the telescope in front of the lamp.

Another improvement of the instrument is to use white porcelain plates having the steps painted black, on the ground side, as this gives a much better surface for reflection than the enameled metal mires. These porcelain plates can be easily added to any instrument by cutting off the mires from the slides, and fastening the plates by means of clamps to the slides.

553 Boylston street.

EXTRA FRONTS—SOME SUGGESTIONS.

BY G. H. WHITCOMB, M.D.

OF GREENWICH, N. Y.

When the unfortunate wearer of spectacles for any form of ametropia is obliged to put on a presbyopic correction, there presents a problem; and the question of what to wear for near work and reading becomes perplexing. Two pairs of glasses are the most satisfactory in results, but troublesome in use. Bi-focal lenses of any kind are not tolerated by most people; and fewer still have the nasal contour to carry eye-glasses before their ordinary correction. Extra fronts scratch and blur the lenses before which they are worn; the hooks get bent, requiring to be corrected before they can be adjusted in place; and they are frequently lost. Yet, on the whole, it seems to me that the most satisfactory solution of the problem will be by the use of the extra fronts, providing that the difficulties mentioned can be surmounted; and to that end I desire to offer some suggestions, viz.—

First:—The frames should have bridge and hooks made more rigid than at present. The eye should be the pulpit or half eye; and the end-pieces should be so adjusted as to allow the fronts to rest as low as the spectacles before which they are worn.

Second:—To secure lightness of weight the lenses should be ground on blanks no thicker than necessary to get the required focus, and the posterior or concave surface should correspond with that of the lens before which it is to be worn. In high grades of myopia where bi-concave lenses of much thickness are used, it may be necessary to set them in their frames in a manner like the fronts, except that they should be set well back of the eye wire. The optical should correspond with the geographical centers in the perpendicular meridian, and in the horizontal decentered inward by 2 to 4 mm.

Third:—Safety, portability, and convenience may be secured by having a small thin case made of thin tempered steel, covered with leather,

and lined with long pile plush to keep the fronts from falling out. The upper end should be open and cut away in front as in the ordinary variety now in use; and be provided with a stud just below the opening to button through the facing of the vest pocket to hold the case securely. A flap may be provided if found by experience to be desirable, to cover the top by buttoning over the stud. This could be readily carried by ladies, or the cord, or chain with hook, as used for eyeglasses, will answer admirably.

The same principles of construction may well be applied to eye-glass cases and those for straight temple frames.

I have found that the common periscopic lenses, set in the ordinary frames after the manner described above very satisfactory indeed; and believe that when the suggested improvements are secured, that the extra front will fill a large place in our prescriptions for presbyopic correction in ametropes.

TRIAL FRAME FOR INTERCHANGEABLE LENSES.

JOHN C. LESTER, A.M., M.D.

Fellow of the American Laryngological, Rhinological and Otological Society; Fellow of the American Academy of Medicine; Assistant Surgeon of the New York Eye and Ear Infirmary; Assistant Surgeon to the St. Bartholomew's Clinic for the Eye, Ear, Throat and Nose; Member of the Medical Society of the County of King, etc.

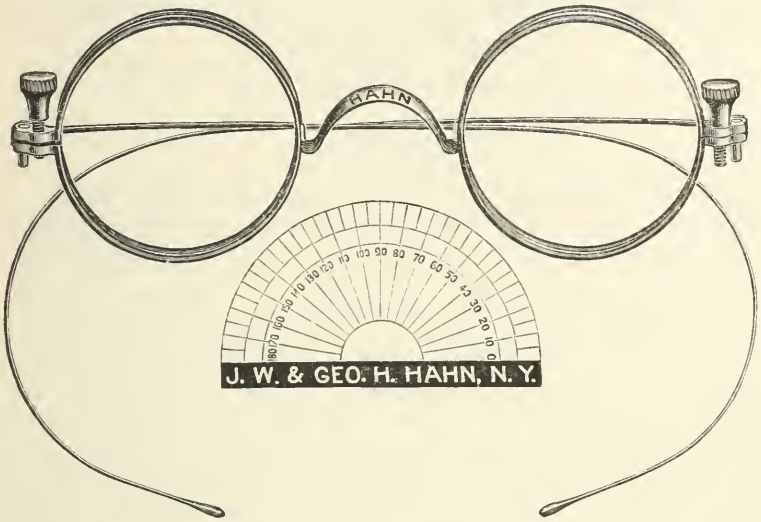
OF BROOKLYN, N.Y.

Illustrated.

No ophthalmologist has failed, from time to time, to experience the necessity of a trial frame adapted, by weight, size and appearance, to a more or less extended use by the patient. Cases of mixed astigmatism, anisometropia, antimetropia and presbyopia, present such a variety of problems, that even those most experienced in the correction of errors of refraction are often at a loss to know exactly what correction will be accepted by the patient, and worn with comfort. These are the cases usually of the neurotic type, which "harrow up the soul" of the super-sensitive ophthalmologist, until, in utter despair, he becomes a veritable "calamity howler" and divines the future estate of the so-called "refracting optician" and himself to be one and the same.

To eliminate, as far as possible, this element of speculation and uncertainty as to the lenses which will be worn with comfort by the patient, the writer has devised a double, adjustable frame, adapted to a set of small lenses of selected strengths, which can be worn indefinitely.

It will be seen that by means of this double trial frame, any number of combinations can be made between cylindrical and spherical glasses. Prisms can also be added, either in the shape of a lorgnette attachment, or in combination with the spherical or cylindrical correction. By means



of a thumb screw at either end of the frame, as seen in the illustration, the interchange of lenses can be instantly accomplished.

The delicacy of the rims not admitting of the various axes being indicated on the frame, a protractor has been added for convenience and accuracy. Messrs. Hahn of New York City, have carefully executed every detail in the manufacture of the frames, lenses and protractors. In the hands of the writer, this temporary trial frame has proven of value in any case where there was an element of doubt which could only be removed by an actual and more or less continued use by the patient of the correction decided upon.

179 Schermerhorn street.

PROPER PREPARATION OF THE YELLOW OXIDE OF MERCURY OINTMENT.

BY T. E. MITCHELL, M.D.

Member of the American Medical Association and the Medical Association of Georgia.

OF COLUMBUS, GA.

Referring to the very valuable suggestions of Drs. Babcock and Keiper, in the August and September numbers respectively of the RECORD, in regard to the proper way of preparing the yellow-oxide-of-mercury ointment for use in ophthalmological practice, I desire to say that, no matter how much time and care are consumed in mixing the powder and the vaseline if no other agent is added, minute particles of the mercury will remain and hence defeat the desire to have it uniformly distributed throughout the vehicle. This obstacle can be easily overcome by observing the following instructions in the preparation of this time-honored and valuable therapeutic agent: To the required amount of powder in an impalpable form on a clean glass or porcelain slab add a few drops of any bland non-irritating fixed oil and mix well with a clean spatula; to this slowly add the necessary petrolatum and, for reasons well known to chemical law the powder is so far reduced by the oil as that it is evenly incorporated in the vaseline.

The following prescription which is a favorite one with me, in the hands of a competent pharmacist will be entirely satisfactory:

℞

Olei Ricini.....gtt iv
Hydrg. Oxid. Flav..gr iij
M et ad
Petrolati .....℥ij–iv
M ft Ungt.

Of course the ointment after all is only a mixture but the mass is so thoroughly homogeneous that not until it is kept for a long while will the mercury if at all, gravitate to the bottom.

I am indebted for the above information to my prescriptionist, Dr. J. P. Turner, ex-president of the Georgia Pharmaceutical Association, and member of the Georgia State Board of Pharmacy.

TWO UNUSUAL CASES OF STRABISMUS.

BY F. W. MARLOW, M.D.,

Professor of Ophthalmology in the University of Syracuse, N. Y.

OF SYRACUSE, N. Y.

Illustrated.

Case 1. Divergence Following Tenotomies Performed in Infancy —Establishment of Binocular Single Vision at the Age of Eighteen Years—Case Perhaps Originally One of Double Vertical Strabismus.

Mr. C. W. P., aged 18 years, a native of Connecticut, was referred to me on February 1, 1892, by Dr. A. C. Benedict, of this city.

At the age of three weeks he was noticed to be crosseyed, and this condition grew much worse after an illness which shortly supervened; at fifteen months both eyes were operated upon, divergence resulting. There seems little doubt from the father's statement that the squint was originally of the alternating variety. He has never seen double, but is conscious that when he looks at an object moving across the field of vision that the eyes "jump," but there is no corresponding alteration in the apparent position of the object.

A year ago, glasses were prescribed for him on account of some asthenopia. He suffers from some aching of the eyes, especially since an attack of facial paralysis (left side) last November, the effect of which has not yet completely passed off. The use of the eyes for near work seems to have no effect on the aching. Some temporal headache. He usually uses the right eye for looking steadily at anything.

Present condition, February 1, 1892:

R. V. $\frac{6}{6}$ partly $+$ 0.75 sph. $+$ 0.25 cyl. 5° } Slight improvement.

Globe slightly prominent, inward movement very defective, so that the inner margin of the cornea remains well outside the lachrymal papilla.

L. V. $\frac{6}{12}$ $+$ 0.75 sph. $+$ 0.25 cyl. 90° $= \frac{6}{9}$

Marked divergence of this eye, which moves in well, the inner margin of the cornea coinciding with the inner canthus. Cannot close the lids perfectly.

February 2. Homatropine:

R. $\frac{6}{18}$ $+$ with $+$ 1.25 sph. $+$ 0.25 cyl. 180° $= \frac{6}{6}$

L. $\frac{6}{18}$ $+$ 1 sph. $+$ 0.25 cyl. 90° $= \frac{6}{6}$ about as well as with R.

Fixes usually with R. eye, but sometimes with L. Probably uses R. for right portion of the field, L. for the left portion. When a red glass is placed in

front of the R., and a green one in front of L., and a lighted candle moved from right to left across the field of vision, the flame appears red until the middle line has been passed 10° or 12°, he is conscious that the eyes jump, and the flame suddenly becomes green without any change in its position. When the candle is brought into view from the left, its color is green, and changes to red suddenly after passing the median line, but nearer to it than in the former case, in spite of the fact that the inward movement of the left eye is far more perfect than that of the right. Will not admit diplopia with or without colored glasses, until prisms = 18° (9° each) are placed base in before eyes; then there is homonymous diplopia, the images being about level and near together.

February 12. With red and green glasses and very carefully adjusted prisms (= 20°) to produce homonymous diplopia, about 5° of R. hyperphoria (or hypertropia) can be demonstrated. On removing colored glasses, the prisms (with a 5° prism to correct vertical error) remaining in position, the images coalesce; on removing the vertical prism, there is temporary diplopia, the two images soon uniting again. If while looking through the lateral prisms the R. eye is covered, it moves upward markedly, and on removing cover to L., the R. moves down again to fix. Similarly L. moves down and up, but to a very slight extent compared with the right.

February 13. With R. pr. 5° base down and 6° base in before each eye, gets binocular single vision. Diplopia is always homonymous whatever prisms are used.

The accompanying photographs show the position of the eyes during fixation, No. 1 with the left eye, No. 2 with the right eye.

The photographs were all taken in the same manner, the *patient sitting directly in front of a window, and fixing the lens of the camera, which was placed directly in line with the patient and window.* A comparison of the relation of the corneal reflection of the window to each pupil shows therefore with the greatest possible accuracy the relative position of the eyes. Attention should be called to the fact that on account of the facial paralysis, the left lower lid occupies a position a little lower than normal. This makes the left eye appear to be a little higher than it really is. A careful comparison of the reflections will correct this impression.

Feb. 14. *Partial tenotomy of R. superior rectus*, leaving images about on a level, but a little uncertain on account of the blurring produced by cocain; only extreme marginal fibres left uncut.

Feb. 15. Image level, but vary a little. R. sometimes a little too high, and sometimes a little too low. On covering first one and then the other eye the movement for fixation seems entirely in the horizontal plane. The right, perhaps, deviates a very little upwards when covered. Its inward movement is decidedly fuller than before, whereas before the inner margin of the cornea could not be brought as far in as the lachrymal papilla, it can now be brought well within it. The patient also volunteers the statement that he can move the eye further in than before the operation. Prisms 3° base in over each eye now give binocular fixation, as demonstrated by cover test.

Photograph 3 represents the appearance of the eyes at this time. This and the two preceding ones were taken in front of a bay window, consisting of three lights. The reflections of the three separate windows can be easily seen with a

magnifying glass, and it is, of course, the lower part of the middle one which corresponds with the visual axis of the fixing eye. If the left eye in the photograph be compared with the left eye of photograph No. 2, a remarkable change in the relation of the reflection to the pupil will be found. In No. 2 the images of two of the windows lie upon the inner limb of the iris, in No. 3 the reflections of the images of all three windows lie within the pupil. In this photograph the position of the images correspond so nearly in the two eyes that it is hard to resist the conclusion that he was fixing the camera with both at the time the exposure was made.

Feb. 16. When L. is fixing, R. certainly appears the higher, but when R. is fixing, L. also appears a little higher than R.

Measurement on perimeter, shows 12° of divergence of R., left fixing.

Measurement on perimeter, shows 20° of divergence of L., right fixing.

Feb. 17. Phorometer (Stevens) and colored glasses shows R. hyperphoria not more than 2°.

*With stereoscope sees L. F. most of time separately, but occasionally combines into E. for moment.

Feb. 21. *Tenotomy of L. inferior rectus*, dividing all but extreme marginal fibres.

Feb. 27. Does not admit any hyperphoria by phorometer, etc., but R. looks higher when excluded, and L. fixes; is certainly able to fix distant candle with both at same time.

Feb. 28. *Advancement of the middle portion of R. internus* by a single suture. A good deal of thickened tissue at site of original attachment. New attachment very irregular and diffuse—tendon small and thin. Effect of operation well marked.

Feb. 29. Eyes look quite straight; volunteers statement that he can use both at same time.

March 1. Says he can look at anything more easily with the two together than with either separately. Undoubtedly has binocular fixation for distant objects, and even up to two feet (not tested nearer); by covering eyes with red and green glasses, candle flame partly red and partly green is seen, and other tests show binocular fixation, but with stereoscope does not unite the two images.† Occasional homonymous diplopia.

March 2. Usually fixes with both. When asked to fix with R. only, makes movements of L. lids, and L. eye deviates *upward and outward*. When asked to fix with L. the R. deviates *upward and outward*.

Photograph No. 4, taken 8 days after the first readjustment shows the usual position of the eyes at this time.

March 12. Occasional marked manifest divergence, but it is usually latent.

March 13. *Partial tenotomy of R. externus*, leaving extreme marginal fibres.

March 27. Some latent divergence still remained, and on account of there remaining some defective movement inward of the R. eye, a *further readjustment of the R. internus* was made.

March 30. Patient has complained of vision being blurred since the operation $V=\frac{6}{24}-0.25$ sph. $+2.5$ cyl. ax. $40°=\frac{6}{6}$ptly: due to visible distortion of cornea (flattening at inner margin) by the tension of the suture.

*This was the only occasion at this period on which he succeeded in combining the two images.

†This was doubtless due to the fact that the two portions of the stereoscopic picture used at this time were too widely separated.

March 31. Blur remains, suture removed, vision being immediately restored, but part of the effect of readjustment lost.

On April 3d, there being still some latent divergence, a *readjustment of the L. internus* was made, and a *partial tenotomy of L. externus*.

April 4. ? Slight latent convergence.

April 8. Phorometer shows homonymous diplopia, requiring prs. = 20° bases out to reverse it. R. when covered moves upward. L. when covered moves upward ? as much as R. According to phorometer there is R. hyperphoria 1°.

I have seen this patient as recently as December, 1897, and photograph number 5 was taken then. It shows the eyes to be perfectly straight, and also that the facial paralysis has completely passed away, as indicated by the normal position of the left lower lid. He has had but little asthenopia, and still wears the glasses prescribed 5½ years ago.

If either eye is covered, it at once deviates upward; and it seems probable from the statement of the patient that very occasionally the left eye deviates up temporarily.

He has binocular single vision as shown by the stereoscope with Kroll's orthoptic exercise plates, but the two images are more easily united when they are brought nearer together. I have no doubt that had the same plates, or plates with the same distance between the corresponding points of the two pictures, been used immediately after the first readjustment operation, that stereoscopic vision would have been shown then, for in all other respects the evidences of binocular fixation were as clear and definite at that time as at present.

There seems to be but little doubt that the binocular function has been in abeyance since the onset of convergent strabismus at the age of three weeks, which is probably equivalent to saying that it never existed; and the condition of the visual fields, or rather the projection of images formed for about 5° to the outer side of the yellow spots upon the outer portion of the F. of V., would indicate that this portion of the retina has received images from the outer portion of the F. from a very early age, and that, therefore, the immediate, or at any rate early, effect of the tenotomies was divergence.

In view of the facts that binocular vision had never existed, or at any rate had not been exercised to any extent, and that the visual axes had become displaced by operations, so as to cause the establishment of false relations between the retinæ and the fields of vision, is it not surprising that the binocular function should have been assumed promptly and without inconvenience as soon as the eyes were brought upon a horizontal plane, and readjustment of the internus had been made?

One of the most striking incidents of the case, was the marked diminu-

1 Fixing with left.

2 Fixing with right.

3 After partial tenotomies of right superior and left inferior recti.

4 After advancement of middle plies of right internus with one stitch.

5 Four years later.

6 Position of head necessary to fix with right eye.

7 Position of head necessary to fix with left eye.

8 Primary result.

tion of divergence, and the even more definite increase of inward movement which followed the partial tenotomy of the R. superior rectus, strongly comfirming the correctness of Stevens's advice not to interfere with the lateral muscles until all vertical deviation has been corrected. A phenomenon calling for remark is the symmetrical vertical deviation, occurring in either eye when excluded from the visual act.

Before operation, with the left eye fixing, the right eye was turned out and decidedly up, but when the right fixed, the deviation of the left eye was purely outward. It was sometimes thought that there was a slight downward deviation, but this was never quite satisfactorily established, and the faulty position of the lower lid, due to paralysis of the orbicularis, added to the difficulty of deciding the point.

After the right hyperphoria had been corrected, each eye when covered deviated upward, and to practically the same extent.

It has been often observed that in cases of old standing divergent strabismus, the diverging eye is also displaced a little upwards, and it has been suggested by some one, whose name I cannot recall, that this upward movement is an adaptive movement, the object of which is to place the pupil under the upper lid and so exclude the false image.

In this case the adaptive movement was complicated by the presence of R. hyperphoria (or left hypophoria). In the right eye the vertical deviation was made up of two elements, the hyperphoria and the so-called "adaptive movement," resulting in a very decided displacement of the eye upward. In the left eye the upward adaptive movement was neutralized by the hypophoria, leaving the eye on a horizontal plane with the fixing eye.

The hyperphoria having been corrected, the adapted vertical displacement became about equal on the two sides.

The greater portion of the preceding report was written three or four years ago, before the publication of Stevens's papers on "Double Vertical Strabismus" in the Annales D'Oculistique in 1895.

The "adaptive movement" above referred to is doubtless an example of that form of double vertical strabismus to which Stevens gives the name anotropia. The case then would seem to have been originally one of anotropia and R. hyperphoria.

I have no doubt that the most important element in the treatment of it was the correction of the hyperphoria.

Case 2. Convergent Strabismus Due to Traumatic Paralysis of Both Sixth Nerves During Infancy—Correction by Operation.

A. Y.—Boy ætas 16 years, was brought to me on May 22, 1895, because he was cross-eyed. The peculiar sudden shifting movements of the head which he made in looking about immediately suggested that the case was not one of ordinary concomitant strabismus, and examination soon showed that it was one of complete paralysis of both sixth nerves.

The history given was that at the age of 18 months, while tied in a rocking chair, he fell forward, striking his forehead against the ground. The crossing of the eyes is said to have come on gradually after this. The source of information is of doubtful reliability.

Examination showed both eyes convergent, and the right turned a little down. Neither eye can be rotated out to the median line, so that in order to fix an object placed exactly in the middle line, and at a distance greater than about 12 or 13 inches, the head has to be rotated to one or the other side, according to the eye chosen for fixation. Movement in all other directions is good. With a red glass before either eye there is homonymous diplopia.

Photograph No. 6 shows the position of head assumed when he fixed the lens of the camera with the right eye.

Photograph No. 7 shows him fixing the camera with the left eye.

There is a history of very prolonged ophthalmia in early life, and focal illumination shows the presence of nebulæ on both corneæ, the right being more damaged than the left These facts doubtless account for the narrowing of the right palpebral fissure.

On June 9th. Under cocaine a thick silk thread was passed through the conjunctiva at the outer margin of the right cornea. By pulling on this thread the eye was rotated a little outward, and fixed thus by tying the thread around the right ear. The tendon of the internus was then detached from the sclera, and as much of it as could be reached cut off with scissors. The muscle was rigidly contracted, making the tenotomy and excision somewhat difficult. The eyeball was fixed by means of the suture in a straight position. The suture was removed on the fourth day.

June 15th. No lateral movement. Patient says right now stronger than left.

June 17th. Similar operation on left.

June 24th. Can use eyes much more easily than before operation.

Photograph No. 8, taken in same manner as those in preceding case, shows the image of the window in the center of each pupil.

A year later the appearance of the eyes still better, on account of increase in the width of the right palpebral fissure. The eyes looked perfectly straight, and without specific examination of the lateral movements, nothing could be observed wrong with them. Lateral movement was not completely abolished, but amounted to not more than 4° or 5°.

TROPHO-NEUROTIC KERATITIS.

BY K. K. WHEELOCK, M.D.,
OF FORT WAYNE, IND.

My attention was first called to this class of cases in March, 1887, when A. F. K., aged 55, a farmer by occupation and German by birth, consulted me with an attack of herpes zoster ophthalmicus of the right eye.

The following condition was present:

A large ulcer on the cornea at the upper-inner segment, with a shallow excavation. Patient complained of a cold sensation in his eyeball, as though the eye were a ball of ice. Anterior chamber was one-quarter filled with pus and the iris bound down to the capsule of lens, leaving the pupil the size of a pin-head. Patient was a strong, healthy man, but his sufferings had greatly reduced him. The ulcerative area had extended at the second visit. The entire cornea was anesthetic. With the use of faradization the sensibility of the cornea returned. At the next visit the corneal sensation was again diminished, and faradization was again employed. After the fourth faradization, sensation remained in nearly normal state. Current had been applied from five to seven minutes over closed lids. There seemed to be no difference which pole was applied to neck. When sensation began to return to cornea, the ulcer began to diminish in extent and depth. Ulcer did not penetrate into anterior chamber, and got well with an eschar.

Three points in this case impressed my mind: First, the diagnostic significance of corneal sensibility; second, the value of faradization in such cases as presented subnormal corneal sensation; third, the pathology of herpes zoster ophthalmicus centering in the Gasserian ganglion. After this I gave much attention to testing corneal sensibility.

In January, 1889, Charles F. K., aged 39, German, machinist, was referred to me by Dr. M. F. Porter, of Fort Wayne, with the statement that patient had gotten particles of sand in his right eye while at work. The notable features were slight lachrymation, very slight photophobia; but no pain — simply a sense of irritation. Inspection showed a scarcely perceptible injection at sclero-corneal junction; no foreign body on cornea or conjunctival surface. The upper outer segment of cornea was roughened as though it had been picked in many places with a minute sharp needle. The statement of the physician, that the eye looked as if it had received a "sand blast" could be readily credited, but there was no history to indicate such an accident. I treated the cornea with a spill of cotton,

*Read before the Chicago Ophthalmological and Otological Society December, 1897.

twisted hard, and found it practically insensible over the area of roughening, but with the unaffected five-sixths of the cornea the sensibility was noticeable, though very much reduced, the reflex being lost. T—; pupil contracted. Treatment continued about one month.

On February 19th notes show that corneal reflex had returned; T minus two and roughened area was smaller in extent and less marked in point of apparent roughness. Treatment had been strychnia, quinine, arsenic and electricity, systematically administered, while locally the usual cleansing solutions were applied. On June 23, 1893, Dr. T. J. Dills, then my partner, enucleated the eye here submitted.

December 4th, 1895, Henry L., aged 55, farmer by occupation, German by birth, consulted me with the following history: Four weeks before, while hauling corn fodder from the field, the wind carried something into his left eye. Had some pain at the time, and rubbed his eye, and for further relief used chamomile poultices, which relieved him of the severe pain. He had suffered from occasional attacks of neuralgia in the head for years, the last attack having been preceded by a chill ; but there was no return of the chill. Never suffered from digestive disturbance. Had suffered much from head pain, which always began over left eye. Years before the pain had lasted for two or three days, but latterly it usually passed off after a sleep of half an hour. Examination showed R.E.S 20-20; L.E.S. fingers at four feet; slight injection of sclerotic. Cornea rough over outer third and center, reflex abolished as shown by touching with cotton spill, T minus. Cornea looks as though fine sand had been dusted over it. Under strychnia, arsenic and quinine, hot fomentations and boracic acid, for a period of ten weeks, he recovered with perfect sight and only a fine nebulous eschar.

February 15th, 1897, E.F.C., aged 31, electrical engineer in charge of Pennsylvania system, consulted me for the purpose of having a foreign body removed from right eye. He had already visited an experienced ophthalmologist in Pittsburg, who informed him that there was a solution of continuity on the cornea, but no foreign body was present. A drop of cocaine was employed, and patient went about his work of inspecting some mechanical devices in the city. He did not note the irritation again until next morning, when he arrived in Fort Wayne. He then called at my office. Inspection showed no infection at sclero-corneal junction. Very slight photophobia, with pupil contracted, and a roughening of epithelium at inner upper quadrant, T clearly minus one. No sensation over roughened area, and practical abolition of corneal reflex when tested over remaining clear corneal area. With the glasses which he was wearing R.E.S. 20/40; L.E.S. 20/15, and treatment with strychnia hypodermically, faradization and hot compresses, he recovered in twelve or thirteen weeks. His functional examination showed R.E.S. 20/70; with + 4 D 20/30; L.E.S. 20/30; with + 4 D 20/30 hyperphoria 2° which had already been corrected by prisms.

Another case is characteristic of these three and I will omit details. The second case detailed, and the first of tropho-neurotic keratitis series, passed out of my hands, because my acquaintance with the prognosis was not sufficient to establish either a maximum or a minimum time during

which treatment should be carried on. The enucleation of the eye by my partner, Dr. T. J. Dills, recalled the history of the case.

These cases present the following features common to all, viz.: loss of sensation in area of corneal involvement; subnormal sensibility, not total loss of sensation, over area of unaffected cornea and abolition of corneal reflex; tension variable, but always minus; contracted pupil; slight pain, if any; slight irritation and then always as though a foreign body were in the eye; little or no circumcorneal injection. The time over which active therapeutic measures should be employed is ten to fourteen weeks. These cases all recovered with good vision and a very slight nebulous eschar.

The name *tropho-neurotic keratitis* is distinctive and I think should be adopted for the class of cases which I have described, because the name is significant of the organs involved and points to the trophic fibers of the Gasserian ganglion as the seat of lesion. The name *neuroparalytic* should be abandoned, except in cases where gross lesion of the brain is present, or the ganglion is involved *en masse*, or when, in the presence of evident involvement of the trophic fibers, there is also a general lesion of the entire ganglion, as shown by loss of sensation throughout the whole distribution of the fifth nerve. Such a case as referred to in the last division I have seen as a result of periostitis of the petrous portion of the temporal bone and due to inherited syphilis. The case in point is that of a little girl, ten years old, in which the trouble was symmetrical, but only the right cornea had undergone central ulceration with perforation. In this case so profound was the anesthesia that a tooth had been extracted without pain, and the incident was referred to as indicating great heroism on the part of the little patient.

Tropho-neurotic keratitis differs in its pathology from *keratitis e lagophthalmo*, in that in the latter condition the lesion of the cornea is the result of exposure from an uncovered cornea, together with general loss of resistance on part of all the tissues. In tropho-neurotic keratitis the lesion is found under the covered cornea. Snellen's theory of exposure and mechanical irritation is not tenable in this class of cases. We must also differentiate from keratitis malacia. We have all seen cases of hemianesthesia of the face in which there has been no desiccation or ulceration of the cornea. I am disposed to think that the sympathetic fibers supplying the Gasserian ganglion play a very important rôle in the nutrition of the cornea. The cases which Noyes refers to as superficial keratitis of malarial origin have all the ear-marks of the cases which I have described, and he, together with all authors including Von Graefe, has failed to distinguish between the gross involvement of the ganglion and the involvement of the trophic fibers alone. Von Graefe described those cases, but

fails to recognize the influence of the trophic fibers. de Schweinitz in "Diseases of the Eye," last edition, describes the trophic and neuro-paralytic form, and casually groups them under "neuro-paralytic" disturbances of the cornea. Fuchs in his admirable work refers to the probable trophic origin of certain corneal ulcers. Schmidt-Rimpler in his third German edition of "Ophthalmology and Ophthalmoscopy," translated by Roosa, comes very near the exact truth in his opening sentence on the subject of keratitis neuro-paralytica. He says: "The form of keratitis which develops in paralysis of the trigeminus may correspond entirely to the xerotic form in its appearance and course." Finally, Meisner and Schiff have shown experimentally that the characteristic inflammation known as keratitis tropho-neurotica occurs when the central fibers of the Gasserian ganglion are divided. In cases of paralysis of seventh, where the cornea is not covered or even swept, except by extreme contraction of superior rectus and inferior oblique, we yet have no evidence of desiccation.

THE JAVAL OPHTHALMOMETER—SATTERLEE'S MODEL.

BY RICHARD H. SATTERLEE, M.D.

Consulting Oculist for Buffalo Railway Co., Buffalo, Rochester and Pittsburg Railway, Buffalo and Niagara Falls Railway.

OF BUFFALO, N. Y.

[Illustrated.]

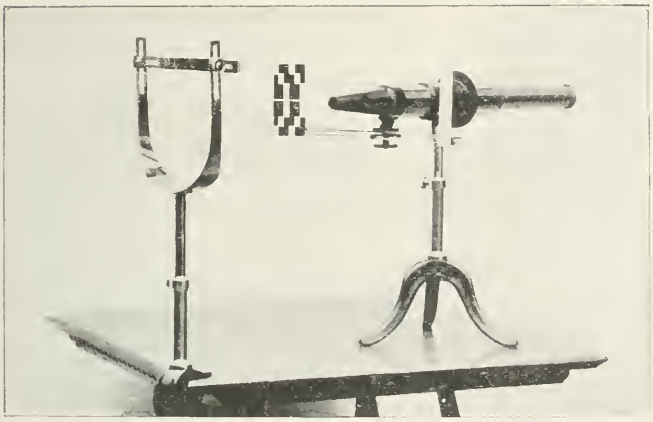
The objection to the Javal-Schiötz ophthalmometer, or its American copy, has been its cost, its size, and weight, and the number of lens surfaces, which latter made very bright illumination of the mires necessary.

What has also tended to discourage the use of the instrument has been the difficulty of finding bi-refringent prisms which were accurately ground and that produced clear images.

The instrument illustrated is made of smaller tubing, the bi-refringent prism of the original Javal being replaced by ordinary prisms, making less illumination of the mires necessary.

As shown, the instrument is used with ordinary daylight. A small disk and two electric lights or Argand gas burners are furnished when it is desirable to use in a dark office. Anyone having occasion to move the Javal, as usually constructed, will appreciate an instrument that can be packed in an ordinary grip.

The instrument is manufactured by the Ogden Ophthalmometer Co., of Buffalo, New York.



THE JAVAL OPHTHALMOMETER.
SATTERLEE'S MODEL.

THE

OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, FEBRUARY, 1898. NO. 2 NEW SERIES.

EDITORIALS.

PILOCARPINE IN CHORIO-RETINITIS AND VITREOUS OPACITIES.

Soon after the introduction of the alkaloid of the *pilocarpus jaborandi* into the general medical armamentarium, the attention of ophthalmologists was directed to its value in ocular therapeutics, quite independently of any local action which it exercised upon the accommodative apparatus or the intraocular tension. Its extraordinary influence as a diaphoretic, as a remedy which facilitated the removal of effusions, and as a medicament which seemed, under certain circumstances, to powerfully stimulate and alter the nutrition of diseased areas, and even of tissues that were not diseased, for example, the hair bulbs, led to its use for the relief of exudative inflammatory affections, especially when located in the uveal tract. Some of the results following the use of this remedy in the treatment of irido-choroiditis with vitreous opacities, equatorial choroiditis with circumscribed choroidal atrophy, diffuse infiltration of the retina and hyalitis, and even the neuro-retinitis of Bright's disease, as recorded by Landesberg in 1881 and von Schroeder in 1883, were strikingly favorable, and as its efficiency became established it was soon recognized as an important remedy in the management of cases of this character.

Although clinical experience has not indicated its utility in the management of keratitis, for example, of the interstitial variety, it has proved its great use in certain types of iritis and irido-cyclitis, as, for example, those recorded by Buller some years ago, its value, in the writer's experience, being particularly great in the iritis and kerato-iritis which sometimes seem to be of gonorrheal origin, and even in those varieties which are probably gouty in nature.

Not only, however, does the remedy seem to be active when it is used in large and diaphoretic doses, but also when employed in more moderate amounts. Thus, in 1892, in the *Archives of Ophthalmology*, Dr. James A. Spaulding contributed an excellent practical paper on idiopathic vitreous hemorrhages, concluding that the most efficient treatment of this affection required the hypodermic use of small doses of pilocarpine, believing, moreover, that it was not necessary to produce visible physiological effects for the remedy to be useful in the eye. Shortly afterwards, in the *Therapeutic Gazette*, the writer described a treatment of vitreous opacities with the fluid extract of jaborandi, and reported a number of cases in which the vitreous had cleared under the influence of the drug when the opacities were hemorrhagic in origin, and also when they had been associated with types of quiet iritis and low-grade choroiditis. None of these cases, of course, were of syphilitic origin.

Recently Dr. Howard F. Hansell (*The Philadelphia Polyclinic*, November 20, 1897,) has published a most suggestive and instructive paper on the use of pilocarpine in non-syphilitic central retino-choroiditis. In one case the vision was raised from $\frac{20}{200}$ to $\frac{20}{20}$? in a month, and in another case from $\frac{20}{50}$ to $\frac{20}{20}$ in one week; in two other cases there was marked visual improvement. Dr. Hansell's description of the action of pilocarpine under these circumstances is so clear that it is quoted in his own words, namely: "The efficiency of pilocarpine is to be attributed to the inordinate activity of the lymph system induced by its presence. By depriving the peripheral vessels of a large portion of their fluid contents those of the internal organs meet the deficiency, thus eliminating morbid products, together with physiologic excretions." An interesting fact in connection with Dr. Hansell's cases is that potassium iodide and mercury had been previously exhibited in large doses without avail.

A word as to the manner of administration. Pilocarpine is to be preferred and the hypodermic method should be adopted. If in rare instances this is not advisable, or is strenuously objected to by the patient, equally good results, although perhaps not so promptly or actively produced, may be secured by enemas of the fluid extract of jaborandi. The hypodermic dose of pilocarpine may vary from a twelfth to a sixth of a grain, under ordinary circumstances, and should be repeated every second, third or fourth day, according to the patient's power of resisting so active a remedy. Now and then, probably owing to idiosyncracy, very disagreeable results follow its use, as no doubt has been the experience of each surgeon who has employed it. Thus, there may be marked nausea, evidences of pulmonary oedema and occasionally serious cardiac

depression. It has been the writer's habit to administer about an hour before the injection thirty drops of chlorodyne. The use of this remedy in this manner has been advocated by so high an authority as the professor of therapeutics in the University of Pennsylvania, and will usually prevent the nausea. During the days devoted to the pilocarpine treatment, small doses of tincture of digitalis may with advantage be administered, tending as they do to prevent cardiac depression and to steady the circulation. Occasionally a patient will be found who curiously resists the action of pilocarpine, while in others the remedy, instead of exciting diaphoresis, will exceptionally produce the untoward symptoms already noted. G. E. DE S.

THE STATUS OF OPERATIONS FOR HETEROPHORIA.

The large majority of ophthalmic surgeons have held aloof from the heresy of "graduated" multiple tenotomies, despite the advocacy in the past of such procedures by several distinguished men whose reputation is conceded and whose genius is admired. Time has shown that there was warrant indeed for looking askance at the assertions of the high priests of graduated tenotomies, not only as regards their claims for the cure of functional nervous affections, such as chorea and epilepsy, but concerning the actual mechanical result upon the muscular equilibrium thereby produced. It is doubted by many that it is possible to cause any permanent effect by one or more so-called graduated or incomplete tenotomies. Those that have tried nicking the tendon of the muscle have found that positive results have not been forthcoming. Even after several or many operations upon the same muscle the equilibrium is found to be the same as before, and only a practically complete division of the tendon and its accessory fibers can produce a permanent result.

The question of muscular advancement, or of tenotomy, has not been settled. Advancement, despite its severity, theoretically offers the most permanent results, as it increases the motility of the eye-ball, whereas this is diminished by tenotomy. But advancement of a weak muscle will ofttimes fail as well as tenotomy of a very strong one, for if the extraorbital causes still obtain the result may be only temporary.

Some advocates of operative interference for ocular imbalance in the functional neuroses fail to recognize the fact that heterophoria, or even squint, may be only a symptom, and that but a small proportion of such cases are dependent upon too powerful or too weak muscles, or improper

insertion of the tendons. Functional heterophoria is largely a child of deficient innervation and is only to be cured by removal of the cause, which is that of the hysteria, chorea, epilepsy or other existing functional disturbance. Exophoria and deficient convergence is a common symptom of these functional neuroses and is known to be a symptom of fatigue in otherwise normal eyes.

The so-called latent heterophoria, more especially esophoria, the production of which is advocated by a recent author, is readily caused by the constant wearing of prisms; and yet even this manufactured heterophoria should, if we would believe a book by this author, be cured by tenotomy. The wide publicity and peculiar advertising by which his work has been forced upon our attention certainly gives cause for the remark that the book is a dangerous one, especially in the hands of the empiric or inexperienced. The acceptance of the so-called principles therein proclaimed, which were promulgated several years ago, has already produced a pernicious effect.

A large number of ill-considered and damaging operations have been done through following these so-called precepts. The cure of diseases, varying from diabetes to dysentery, and from trachoma to teratoses, by the method of operating upon the ocular muscles, has been proclaimed from the housetops. A number of instances are known to the writer where bungling operations have been done without warrant by these men and, sad to say, by some men whose professional attainments are popularly esteemed good, in which the sclera has been cut through, detachment of the retina and loss of sight or even infective panophthalmitis has been produced, to say nothing of loss of ocular motility or diplopia. The incoördinating ocular muscles in tabes dorsalis, paralyzed muscles and their antagonists, have been interfered with, followed by resultant diplopia and squint, which could not be entirely remedied by secondary operation.

The era of indiscriminate and ill-advised operating has passed for those who have their eyes open, and conservative practitioners hope to soon see the day when this dangerous heresy has been relegated to deserved oblivion.

Any operative interference with the ocular muscle apparatus should only be done after full trial of muscle exercise, correction of refraction, attention to the general health, and apparent cause. But one, or at the most two, operations are allowable upon the same muscle. In many cases prisms relieve the symptoms sufficiently to render operation obnoxious to the patient.

Some good has come out of Egypt; the technique of tenotomy and muscle advancement has been revolutionized. Through the phorometer, the Maddox rod, the tropometer, the revolving prisms and their modifications, we are now able to establish definite data concerning the deviation, excursion and strength of the muscles and to accurately limit the effects of our operative procedures. Through the recognition of the dependence of muscular equilibrium upon proper innervation we exclude many cases of heterophoria, and cure without recourse to weakening the eye further by tenotomy.

The fact that many causes may combine to produce imbalance of the ocular muscles is now being learned, and although we recognize the fact that disturbances of the ocular equilibrium produce symptoms which may show as headache or nervous reflexes far from the eye, we are learning to take a broader view and to search for and attack the primary causes which in many cases are not within the orbit. We should remember the fact that muscle imbalance may be a symptom of nervous derangement, as well as that eye strain may produce reflex nerve disturbances.

H. V. W.

THE INCORRECT USE OF CERTAIN WORDS AND PHRASES.

Some time ago a contributor to the columns of a journal devoted to general medicine contended that the use of *cycloplegia* and *mydriasis* as synonymous terms and of *mydriatic* and *cycloplegic* as interchangeable adjectives and adjective-nouns is one of the commonest errors one meets with in medical literature. There seems to be reason for repeating this statement and to point out once more (see *Journal A. M. A.* Mar. 9, 1895) that a mydriatic may be, but is not necessarily, a cycloplegic, even though a cycloplegic is usually a mydriatic. A giant is always a man, but men are not necessarily giants. The electric current and a quarter-grain solution of cocain are, under certain conditions, mydriatics, but neither of them is a cycloplegic. If one wishes to refer specifically to the dilatation of the pupil the ancient term *mydriasis* should be employed, reserving the modern word, cycloplegia, (from κυκλος, a circle, *i. e.*, the ciliary ring, and πληγη, a stroke) for indicating a paralysis of the ciliary muscle.

The following sentence will serve to indicate these differences of application; "if one desires to measure the total ametropia it is usually nec-

essary to employ a *cycloplegic* (not mydriatic), but for an examination of the fundus a mydriatic will suffice."

The following sentences contain examples of the improper use of certain words that occur occasionally in our medical journals. The objectionable words are italicized: (*a*). On the next day we *operated* the child. (*b*). Care should be taken not to *operate* the cataract too soon. (*c*). If the *operated* eye remains quiet it is better to interfere early. (*d*). These symptoms may be due to a swollen *turbinate*. (*e*). The *iritic* reflexes were found to be normal. (*f*). It is often difficult to *refract* such a patient. (*g*). In cases where the *refracted* eye is shown to be emmetropic (*h*) the *refractor* places a convex lens before his own eye.

(*a*), (*b*), (*c*). In Vicente Salva's Spanish-Spanish-Latin dictionary, the nearest approach to a Latin equivalent of the Spanish word *operar, to operate upon*, is given as *operationem chirurgicam peragere*. The English language has in this particular followed the Latin construction more closely than the so-called Latin languages themselves. There is no single transitive verb (derived from *opus*) in either tongue that conveys the idea of the performance of a surgical operation. If there be such it will be found in the works of modern writers of Latin who, under German, French, Italian, or Spanish influence, have coined a corrupted derivative (*operare*) from the deponent verb *operari*, which has quite a different significance from *operar*, *opérer*, *operare* (Italian) and *opereiren*, which are, in a perfectly legitimate sense, transitive. It is probable that the above mentioned and objectionable use of the English verb may be traced to the same source. This probability will be brought out by the following short sentences and phrases taken at random from foreign publications: *Ich habe das operirte Auge sehr oft untersucht. Einen Blinden, die Augen, den Staar u. s. w. operieren. Ce chirurgien est habile, il opère parfaitment bien; il a opéré dans la jaurnee deux hommes qui avait la pierre. Il primo a operare con successo l'estirpazione della laringe fu un italiano.* So that while the continental surgeon we are best acquainted with usually *operates* his patients or their organs, *we* must continue to operate *on* or *upon* them.

(*d*). This word is never used as a noun, although there is abundant authority for the employment of *turbinal*—meaning a turbinated bone. For example, in Huxley's "Anatomy of the Vertebrates" occurs the following: "Forming the floor of the front part of the nasal chamber on each side is a large concavo-convex bone . . . which is commonly termed a *turbinal* . . . does not truly correspond with the *turbinals* of the higher vertebrata." This pretty well disposes of the argument (in

favor of "turbinate") that we have no single word in English to designate a turbinated bone.

(*e*). A moment's consideration of the fact that the adjective *iritic*, like *neuritic* and *pleuritic*, has to do with the inflammation of the part designated by the first portion of the word, should be sufficient to prevent the mistake of using it to refer to the part itself. On the other hand, this improper use of *iritic* is not uncommon; I have lately seen it so employed in one of our most widely known medical journals. Legitimate adjectives (derived from *iris*, gen: *iridis*) are numerous enough; there is good authority for *iridal*, *irian*, and *iridian*, not to mention the frequent and proper use of the noun *iris*, as an adjective.

(*f*), (*g*), (*h*). It is not uncommon to witness the incorrect employment of these words, even by those who make some pretensions to scientific accuracy. If we think of their etymology (or consult any dictionary) it will not be difficult to show the inaccuracy of connecting the idea of personality with any of them. One may properly *measure* or *determine* the refraction of a patient's eye,—but ought not to say: "I advise you to refract Mr. Jones," or "You had better refract both his eyes," which would be tantamount to condemning Mr. Jones or his eyes to be broken up or bent back (*re* and *frangere*). In the same way the noun, *refractor*, has been incorrectly given a new meaning—that of a person who determines the refraction of the ocular media, *vulgo*, a man who fits glasses. One meaning of *refractor* is that of a telescope, and the idea is of something that refracts, or turns from their course, light or sound waves.

Although it is undoubtedly true that we cannot with propriety speak of *refractor*, *refract*, and *refraction* apart from a *thing*, yet it cannot be denied that the phrases, "to measure Mr. Jones's refraction," and "to determine the refractive condition of Mr. Jones's eyes," are entirely too clumsy and eat up too much time. Already, in England especially, the shorter expression, "to measure Mr. Jones" (for glasses) is in vogue. In practice this would be less objectionable (to Mr. Jones himself and others) than "to refract Mr. Jones," who might be hard to bend or break.

There is a demand, but less urgent, for some term that will designate the person doing the refraction work above referred to, but that "refractor"—"refractionist" is, possibly, better—meets this philological want is at least doubtful. C. A. W.

REPORTS OF SOCIETIES.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS, OF PHILADELPHIA.

Meeting of the Ophthalmic Section of the College of Physicians, December 21, 1897, the chairman, Dr. Wm. F. Norris, in the chair.

Dr. S. D. Risley presented a case of *Cyst of the Orbit, with an Unusual Place of Exit.* The patient is a female child one year old, who has an elastic, almond-shaped tumor on the left side of the face near the nose. It is slightly bluish, not larger, under ordinary conditions, than the kernel of the almond, but when the child cries, or if the head is held downward, the size and nevus-like discoloration are greatly increased. Dr. Freeman examined the nasal passages, and reported that he could discover no nasal conditions to account for its presence. There is no trouble with the lachrymal sac or duct, although its proximity to these structures at once suggests a possible affection of the tear sac. Gentle pressure entirely empties the tumor, which immediately refills when the pressure is removed. When firm pressure is made with the finger on the inner end of the inferior orbital ridge, it is not possible to empty the tumor. When the child is lying on its back asleep, emptying the sac by pressure causes an unmistakable bulging forward of the closed upper eyelid and a disappearance of the palpebral fold. At times there seems to be also a very slight movement forward of the eyeball. The parents first noticed the bluish tumor when the child was but five months of age, and think that it has slowly increased in size. Its nature is problematic. It seems likely that it is a dermoid orbital cyst presenting itself forward over the lower bony rim of the orbit instead of below the superior orbital rim, as is usual. In all respects, except the point of exit, which is certainly very unusual, it presents the same features as the case shown at the last meeting by the president of the Section.

Dr. G. C. Harlan showed a woman, fifty-four years old, with *Exophthalmos, Due to Disease of the Maxillary Antrum.* She had first noticed, in October, the protrusion of the ball and occasional diplopia. When she

came to the Pennsylvania Hospital on November 16th, there was decided exophthalmos and up and outward deviation of the eye, which could be partially reduced under pressure. Nothing abnormal could be felt in the orbit by exploration with the finger. There was a diffused swelling of the cheek and temple, but little or no tenderness. The fundus was normal, excepting a moderate congestion of the retinal veins. The left side of the nose had been obstructed for a year, and was found to be filled with growths which were removed with difficulty on account of free hemorrhage. Those first removed resembled ordinary polypi, and were pronounced to be adenoma-myxomatous in character, since no trace of malignant infiltration was evident. The deeper portions were undoubtedly sarcomatous.

The exophthalmos had decidedly increased during the past month, the lids were edematous, the anterior wall of the antrum was bulging and tender to the touch, and the lateral wall, felt through the mouth, was extended. A small, firm growth had appeared in the orbit just external to the lachrymal groove. There was little doubt that the case was one of sarcoma of the antrum, extending into the orbit.

Dr. Harlan also presented two cases of *Traumatism of the Orbit.* One patient had received a severe blow with a monkey-wrench over the malar bone. He was stunned, and remained unconscious for half an hour. He had nasal hemorrhage, conjunctival and palpebral ecchymosis, exophthalmos, diplopia, extensive swelling of the lids, and emphysema. After subsidence of the swelling it was found that the levator and superior rectus were paralyzed. Fracture by contrecoup of the roof and inner wall of the orbit was diagnosed.

In the case of the other patient a violent blow on the superciliary region was followed by orbital cellulitis, with exophthalmos and abscess. Three incisions were required during the treatment. There is now enophthalmos and paresis of the levator and superior rectus—the result of atrophy and cicatricial contraction of orbital tissue.

Dr. Harlan had at the same time under treatment a man who had been kicked in the region of the glabella. He had enormous emphysema extending as far back as the posterior edge of the parietal bone, probably the result of fracture of the lachrymal duct. He was quite well in a few days.

Dr. William Zentmayer exhibited a *Case of Probable Remnants of the Sheath of the Hyaloid Artery*, showing a pyriform, white, connective-tissue mass springing from the porus opticus and extending forward, upward, and toward the mascular region in front of the retina. It is about

1½ disk diameters in length and about ¾ in width. Projecting from the lower part of the anterior surface there is a conical mass of similar appearance. Two streamers come forward into the vitreous, one toward the posterior pole of the lens, the other toward the temporal side. The level of the fundus is 1.5 D, and that of the growth 4 D.

Discussion.—In answer to an inquiry of Dr. Shaffner, Dr. Zentmayer replied that no opacity of the posterior pole of the lens is present.

Dr. Randall was uncertain that the diagnosis made by Dr. Zentmayer is correct, since in many cases that have fallen under his observation, remnants of the artery have always extended toward the nasal and not toward the temporal side. They are frequently uncomplicated by opacity of the capsule or lens, even if branching upon the posterior pole.

Dr. B. A. Randall reported a *Case of Transient Opacities of the Lens after Traumatism*, and spoke of the importance of noting the frequency and limitations of such changes. A small boy, struck on the left eye by a stone, presented an hour or two after the injury an abraded cornea, blood-stained aqueous, and anterior polar opacity of the subluxated lens. As the media cleared no fundus lesions came to sight; but circles of minute vacuoles around the anterior pole of the lens seemed certainly within the capsule, although resembling the remains of an annular synechia, while many vague shoots of opacity were seen in the periphery of the median layers. The unfavorable prognosis was most agreeably falsified, and all opacities gradually faded and had completely disappeared, with restoration of good vision, two weeks after the injury.

Discussion.—Dr. Frank Perkins had observed, in a case of traumatism inducing a small retinal detachment, hyalitis and opacities of the posterior lens capsule, that after twelve months the capsular opacities had disappeared and the vitreous had become clear.

Dr. Randall also reported a *Case of a Secondary Center of Distinct Vision* in an eye that had squinted. A woman of 54 who had convergent strabismus after whooping-cough at three years of age, had double-squint operation when 31 years old, followed by decided divergence. Habitually the left eye diverges about 20° in distant vision as measured on the perimeter, yet vision is partly binocular and any diplopia is homonymous. With her H.As. corrected, vision is almost perfect in each eye, and full $\frac{6}{5}$ with both, although the left has to come in 20° when the eye is covered. At near work with presbyopic correction there is binocular vision, with no divergence, but some 8° of insufficiency, partial correction of which, by decentering her glasses, is relieving her asthenopic symptoms.

Discussion.—Dr. Harlan referred to a case in which he had extracted

a cataractous lens from an eye with long standing convergent strabismus. When the bandage was removed the patient recognized her daughter, who stood directly in front of her, but saw her in the extreme outer periphery of the visual field. This false projection lasted only a few days.

Dr. Edward Jackson read a paper on *Removal of the Clear Lens for High Myopia*, and presented a young man upon both of whose eyes he had operated. The lens had been first needled and later extracted. In the first eye the needle was free, the changes in the lens rapid, and the reaction severe, resulting in vitreous opacity, which required three months to clear up. In the other eye but a small opening was made in the capsule, and the lens substance was removed before the reaction became severe, and good vision was obtained as soon as the pupil cleared. The vision with the correcting lenses, before removal of the crystalline, was $\frac{5}{30}$ and $\frac{5}{25}$; after removal it was $\frac{5}{9}$ in each eye, with weak compound convex lenses.

The operation undoubtedly has a real field of usefulness. Those who had written upon it have, so far, failed to demonstrate scientifically the amount of myopia to be corrected by removal of the crystalline. Assuming that its refractive power was constant, when the effect of its removal was measured at the cornea instead of at the position of the lens, it would make an essential difference whether that effect was to be compensated by a convex lens, or whether it was measured by a concave lens.

To solve problems of this sort a *dioptric eye* was suggested, in which the refraction of the eye was conceived to occur at two infinitely thin lenses, one situated at the apex of the cornea having a focal distance of 31 mm. (a refractive power of 32.26 D.), the other 6 mm. behind the cornea (having a refractive power of 20 D.). These acting together would focus parallel rays 16⅔ mm. behind the second lens, or 22⅔ mm. behind the cornea, corresponding to a refraction of 44.12 D. With such an eye the removal of the crystalline lens, supposing the eye to be previously emmetropic, would cause hyperopia of 11.86 D., measured at the cornea, which would be corrected by a 10.5 D. convex lens placed in the ordinary position for a correcting lens.

On the other hand, if the retina were situated just 31 mm. behind the cornea, where it would receive rays perfectly focused by the action of the cornea alone, it would have, before removal of the crystalline, a myopia of 14.30 D., as measured at the cornea, which would require for its correction a concave 17 or 18 D. lens placed in the ordinary position. This amount of axial myopia, then, is what we may expect to correct by removal of the crystalline lens. If the myopia were due to excessive

curvature of the cornea or crystalline, the amount corrected would be different.

The enlargement of the retinal images secured by removal of the crystalline as compared with the retinal images obtained by correcting-lens placed at the anterior focus of the eye amounts to over 50 per cent. Such an enlargement of the retinal images and the avoidance of strong glasses are the chief benefits to be obtained by removal of the clear crystalline-lens.

In planning the operation for removal of the crystalline, the existing corneal astigmatism should be taken into account, and the incision so placed as to correct it, or utilize it to partly correct the astigmatism produced by the operation.

Discussion.—Dr. H. F. Hansell spoke of the great practical value of Dr. Jackson's paper, and exhibited, in illustration, a patient who had been operated on, in one eye, some years ago in Russia. As a means of checking the growth of the myopia and the fundus changes, and of reducing the myopia to a very small amount, the operation had been entirely successful. But in this case an inoperable degree of M. on the other eye, correctable by a concave sphero-cylinder and preservation of accommodation, prohibited binocular simultaneous fixation. Should, however, the M. increase or detachment of the retina occur in the unoperated eye, the benefits of the operation would be promptly appreciated, but removal of the lens in one eye only is of very little immediate advantage, provided M. and disease have not rendered the second eye unfit for use.

Dr. Shaffner mentioned as difficulties to be encountered in the removal of the lens, the sticky, soft lens matter that must be extracted from the anterior chamber, the repeated operations often necessary, with their attendant dangers to the safety of the eye, and the loss of accommodation. The only case he had ever seen bitterly regretted having submitted to the operation.

Dr. Jackson said that if the myopia was so high that correcting-glasses could not be worn, the power of accommodation was of no practical value. If correcting-lenses could be worn with comfort, of course the power of accommodation was of great value. The loss of accommodation, therefore, need not weigh against removal of the crystalline in the only cases requiring it, namely, those which could not wear correcting-lenses. In the case shown by Dr. Hansell the difference in refraction between the two eyes precluded their satisfactory working together; and the patient was clearly better off for having the power of accommodation in one of them, since he could wear a correcting-lens and make this

power useful. He had recently seen a case with 20 D. of myopia, who got some benefit from correcting-lenses, but found them so annoying that he often laid them aside. In this case 15 D. of the myopia was due to excessive curvature of the cornea, and working the case out with the aid of the dioptric eye, it was clear that less benefit was to be expected from removal of the crystalline than if the myopia were axial.

HOWARD F. HANSELL,
Clerk of Section.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held January 11th, 1898, Dr. Montgomery in the chair.

Dr. Casey A. Wood reported a case of *Primary Sarcoma of the Lid*, in a baby 7 months old, in whom a slight elevation on right upper lid was first noticed when child was 6 weeks old. When first seen by Dr. Wood there was present an irregular oval, apparently movable body of rather firm consistence, and of the size of a white bean situated on the right upper lid occupying the junction of the middle and inner third of the lid. In appearance it was not unlike the ordinary chalazion. The dermal vessels were slightly more numerous and larger than those of the opposite side. The vascular supply is decidedly greater than in the ordinary non-suppurating chalazion. The tumor was removed completely from the conjunctival surface. Dr. W. A. Evans, of Columbus Medical Laboratory, examined the growth and reported as follows: "The tumor appeared to be encapsulated. Microscope showed it to be composed of round and spindle cells—more of former—with considerable intercellular substance. Some pre-existing fibrous tissue, an artery with unusually thick walls. The growth is a sarcoma."

This paper will appear in full in the March number of the OPHTHALMIC RECORD.

Discussion.—Dr. C. P. Pinckard asked Dr. Wood how he happened to think of sarcoma. He did not see anything in the description of the case that would contraindicate a diagnosis of chalazion.

Dr. Wood said in answer to Dr. Pinckard, that perhaps he did not lay sufficient stress on the fact of the markedly increased vascular supply of the tumor both on the skin aspect as well as on the conjunctival surface. The vessels, not only upon the tumor itself, but at its borders, were very

much larger and more numerous than they are in non-inflamed chalazion.

Dr. Frank Allport showed a case with *Incipient Choroidal Leucosarcoma.*

The patient, a woman, twenty-eight years of age, has a vision of $\frac{20}{20}$ in each eye, and compound hypermetropic astigmatism of medium degree. She has headaches and other asthenopic symptoms.

Two years ago she became broken down nervously, a tendency which has never disappeared. On the right side, an exophthalmic goitre is present, accompanied with enlarged thyroid gland, irregular pulse, occasional profuse sweating, and nervous murmur in the neck. Right fundus is normal except enlarged and tortuous veins.

Incidentally, in the course of the examination, a small roundish grayish-white elevation or tumor was discovered just to the macular side of the disc, which it apparently joins. The tumor is about half the size of the nerve head and looks like a mass of clouds bursting forth from the fundus. The elevation measures about three-quarters of a dioptre, but if the eye is moved to one side or the other the observer may easily see it in raised profile. A retinal vessel courses over its surface, showing it to be under the retina, and some pigment on its surface would seem to indicate it to have originated in the choroid. Forming a semicircle around it may be seen many pigmented choroidal splashes. She has slight ptosis of this eye.

Dr. Allport suspected this elevation to be a leucosarcoma of the choroid, but time must verify this conjecture. If it is, it is a most interesting case, as ophthalmic literature records but few instances of *observed* incipient choroidal leucosarcoma.

Her peripheral field for white is perfect. I did not test for scotoma, on account of the weariness of the patient, and have not seen her since.*

Dr. Henry Gradle reported a case of *Tarsitis,* a full report of which will appear in the March number of the Ophthalmic Record.

Discussion.—Dr. H. M. Starkey had referred this case to Dr. Gradle's clinic; and from the history he thought the case was probably specific in origin. The mixed treatment was given in moderately full doses without result.

Dr. Wood asked Dr. Gradle whether there was a history of acute articular rheumatism in the case.

Dr. Gradle said, not to his knowledge.

Dr. Charles M. Robertson, of Davenport, Iowa, reported a case of

*Since this report Dr. Allport has examined the patient's field and found a small scotoma, especially for red and green in the neighborhood of the physiological blind spot.

Glio-Sarcoma of Optic Nerve with specimen, in a healthy boy, 10 years of age, who had for the past two years exhibited exophthalmus of the right eye, gradually increasing until the eye so protruded that the lids scarcely covered the equator of the globe. The case was presented to him for opinion, and its immediate removal was advised. The resistance behind was so great that it was certain there was some sort of solid tumor behind the globe. The motion of the globe was *nil*, as was the visual power. There was some lymphatic engorgement (sub-maxillary), but otherwise no abnormal signs or symptoms. The specimen, showed the eye and tumor as taken away. At the posterior end of the globe the optic nerve was cut off just behind the entrance to the eye, showing a comparatively healthy appearance. The tumor lay immediately behind the eyeball, being a true optic nerve growth. It was encapsulated in front, but attached behind, to the periosteum just external to the edge of the optic foramen. After loosening the tissues around, the tumor was pulled forward, so that excision was made behind the tumor. The growth upon examination proved to be a glio-sarcoma. It was removed in August, 1896. The boy is wearing an artificial eye, and so far there have been no signs of recurrence.

TRANSLATION.

THE NATURE OF GLAUCOMA. EXPLANATION OF THE CURATIVE EFFECT OF IRIDECTOMY. By Dr. Ch. Abadie, Paris. (Translated from the November number of the *Ophthalmologische Klinik*, by Dr. Dunbar Roy, Atlanta, Ga.)

The cases of acute and subacute Glaucoma, with their transitory symptoms (cloudy vision, colored rings around the lights), are to be explained neither by a persistent change in the region of the sclero-corneal junction nor by the decrease of the angle between the iris and cornea, nor by structural changes in the spaces of Fontana. Persistent changes must represent functional disturbances which are persistent and not transitory in their character.

The nervous system certainly is obliged to be interested in such transitory disturbances as disappear without leaving even a trace behind them. Indeed, the opinion of a nervous origin of glaucoma has already been expressed, and in fact, up to the present, the fifth pair of cranial nerves has been described as playing the chief rôle. On account of new discoveries as to the anatomy and physiology of the nervous system, the trigeminus may have to lose some of the functions as not belonging to it. It is simply a nerve of sensation whose sole and only function is to carry the peripheral impressions to its center. It is centripetal and not centrifugal. As has generally been held up to the present the trophic influence, which this nerve was thought to exercise upon the nutrition of the eye, must be attributed to a branch of the sympathetic which accompanies it and which forms a part of the ciliary nerves.

Should one repeat the classic experiment of Majendie and Snellen, namely, the section of the trigeminus within the cranial cavity, in order to produce disturbances of nutrition in the cornea, then these disturbances will not occur or will be limited in their effect, if one at the same time should cut through the cervical sympathetic on the same side. Through the labors of M. Spallitta (*1.*) these facts have been clearly set forth. Similar results can be accomplished by surgeons, since the removal of the Gasserian ganglion is almost never complicated with an involvement of the eye. (*2.*)

The branch of the sympathetic which runs along with the body of the trigeminus in the cranial cavity in order to reach the path of the ciliary nerves to the eye, must certainly play the most important rôle in these nutritive disturbances of the eye.

After the presentation of these facts we will now show that in glaucoma everything gives the appearance as if sometimes a transitory, sometimes a persistent excitation of the vaso-dilator nerve fibres of the blood vessels in the eye had taken place (representing the acute and chronic forms). This, just as I hope to show, is the true origin of the disease. All other symptoms and diseased appearances arise from this. The increased intra-ocular pressure results from the increased blood pressure in the vessels, and perhaps also from the augmented secretion of the intra-ocular fluids which is the result of this last condition. François Franck made the important observation that the vaso-dilators of the eye had the same origin in the spinal cord and ran in the same passage as the nerves which produce a dilatation of the pupil. On this account, it is indeed scarcely remarkable if the pupil in glaucoma is constantly dilated. Excitation of the dilator nerves of the pupil takes place at the same time as that of the vaso-dilator of the blood vessels of the eye. But the most positive proof that glaucoma is really due to the dilatation of the blood vessels of the eye is found in the action of mydriatics and myotics. With the help of these substances we can suddenly produce glaucomatous symptoms, or cause them to disappear. But these remedies only produce a dilatation, or the reverse—a contraction of the vessels of the eye, just as they influence the size of the pupil. Atropine always aggravates the glaucomatous symptoms, if it does not directly cause them. Atropine has, therefore, an indubitable vaso-dilator action. Eserin, on the other hand, always lessens the intensity of the glaucomatous symptoms; it acts, therefore, especially by producing a constriction of the vessels. By means of the use of these two remedies glaucoma may either be produced or made to disappear. Therefore, we are in a position to prove by experiment the real nature of the disease and are even able to demonstrate it.

An iridectomy is more certain in its result in cases of acute glaucoma—subacute glaucoma—and, especially in those cases where the functional disturbances are intermittent. How can we explain the beneficial results of this operation? Our views upon this subject are as follows: Under normal circumstances, the excitor nerves, which regulate the opposite conditions of dilatation and constriction of the blood vessels, run through the nerve plexus situated in the middle part of the iris. In the cells of the iris there also terminates a certain number of ciliary nerve-fibers. If the vaso-

dilator nerve excitation preponderates, then this impulse passes without interruption to the above-mentioned nerve plexus, in which the nerve force probably stores itself up; the dilatation of the blood vessels of the eyes is, therefore, the result. Should we, however, cut through this circular net of nerves, then this excessive irritation of the vaso-dilator nerves of excitation will cease, and everywhere there will appear the former equilibrium. At this time the blood vessels are as yet only dilated to a moderate degree. By means of an iridectomy the excision of the iris itself is followed by results not near so beneficial as the removal of a portion of the nerve net, which is situated in the middle portion of the iris tissue.

That this theoretical explanation is well grounded can easily be proven. If you remove, in acute glaucoma, only the sphincter of the pupil, as it many times happens, or only the ciliary periphery of the iris without touching the middle portion, which contains the ciliary plexus, then the result of the operation is nearly always partial. On the other hand, let us be content to remove that portion of the iris in which is found the nerve elements, and let us leave the sphincter and the ciliary portion untouched, then the eye will heal just as favorably as when a complete iridectomy has been performed. For this reason it is unimportant whether the iridectomy be broad or small, provided only that the whole breadth of the iris be removed. I go even further, and say that a simple slit in the iris, without excision, would even be sufficient. That the incising of the sclera and cornea, a sclerotomy, in spite of the opinion of several authors, exercises no healing influence upon the eye, demonstrates the fact, moreover, that in this operation without iridectomy, only a transitory improvement is established, and that the glaucoma always returns again. Moreover, should a typical iridectomy be made, even if only the cornea is incised, then the result is just as satisfactory as when the incision has been made in the sclerotic. [A fact noticed by the translator.]

All this, as I believe, satisfactorily and convincingly proves that the glaucomatous symptoms will be lessened only by the excising a part of the ring plexus of nerves which is situated in the iris tissue. Chronic glaucoma presents a somewhat different picture; here the glaucomatous symptoms are not intermittent. The intra-ocular pressure increases slowly, but progressively, and produces, while it continues, a glaucomatous atrophy of the optic papilla without showing the slightest reaction. In this form of glaucoma, usually neither the iridectomy nor the sclerotomy give permanent results. Shall we, for this reason, conclude that the nature of this disease is different from the other? On the contrary, by no means. Even in this form atropine and eserin act in the same man-

ner as in the acute forms, or in such as are intermittent in character. Here, also, the dilatation of the blood vessels play an important rôle, for the instillation of atropine always increases the severity of the symptoms. Eserin and pilocarpine, however, with their like action upon the blood vessels, always produce a decided improvement in the symptoms. We can even justly call it the one healing remedy for simple chronic glaucoma. But these myotics exercise a healing influence only on the condition that they be instilled regularly and systematically every day. Just as soon as we cease their use the intra-ocular pressure rises anew, and the disease takes its usual course. Why does this happen? For the reason that after twenty-four hours the vessel-constricting power of the eserin and pilocarpine is exhausted, and new instillations are necessary in order to keep up the constricted calibre of the vessels. We can, indeed, offer no more convincing proof than this.

In simple chronic glaucoma the dilatation of the blood vessels of the eye is continuous. If it, as it might be, according to some authors, were a question of giving away of the tunics of the eyeball, or even of the optic nerve, would the action then of the atropine and the eserin be explicable, with whose help, so to speak, we can at pleasure modify the disease? Yet another question: Why is the iridectomy by this form not near so beneficial as it is in the acute and intermittent? An explanation is, indeed, not easily found; however, I may be permitted to express my views upon this subject: In the acute and intermittent forms the vessels in the anterior portion of the bulb are especially concerned. The dilatation of the vessels will be noticed then in the ciliary region and the iris; the nerve branches, which regulate the vaso-dilatation and the vaso-constriction of this region blood vessels, are exactly those which run into the nerve plexus of the iris.

Should we cut through this plexus then the dilatation of the vessels would have to cease. This hypothesis is just as plausible as that for the vaso-dilator nerves already mentioned above, having as they do the same origin and running in the same course as those nerves which produce a dilatation of the pupil. In simple chronic glaucoma, was there then no more filling of the blood vessels in that portion of the eye, these changes would be noticed. Only in the choroid would dilatation of the vessels appear; therefore, the appearances then of hypersecretion which accompany every dilatation of the vessels might be far less pronounced, and the tension would likewise increase much more slowly. On the other hand now, the vaso-dilator nerve fibres of that region are not the same as those for the vessels of the iris, nor do they terminate also in the nerve

plexus of the iris; nor is any incision through this plexus able to produce any further curative effect. With the iridectomy we are, indeed, fortified to be able to combat all forms of the acute, subacute and suddenly-appearing forms of glaucoma. Against the simple chronic glaucoma, however, we possess measures of far less beneficial value. In many cases neither the iridectomy nor the sclerotomy give satisfactory results, while even myotics, although employed regularly and systematically, do not produce a healing of the pathological condition, and in time the eye remains just where it was before. We are even obliged to acknowledge that there are certain forms of simple chronic glaucoma which, in spite of an iridectomy, sclerotomy, and the continued use of myotics, take on an extremely protracted although progressive course, which finally leads to blindness. In such cases as defy all our present therapeutical remedies the healing must be sought from other measures.

According to our meaning we could limit the influence of the vaso-dilator nerves of the eye by cutting through the body of the cervical sympathetic in which the vaso-dilator nerves run just as has been done before in Basedows' disease and with marked result. Even now, I believe I am able to predict that section of the cervical sympathetic is destined to play an important rôle in ophthalmology. The extirpation of the ophthalmic ganglion would probably give good results, but on account of the smallness of this ganglion, situated deep in the fatty meshes of the orbital cavity, and the great difficulty of avoiding section of the ciliary nerves and the central artery of the retina, this operation can scarcely be considered as practicable. However, in cases of painful glaucoma, with loss of visual power, one might choose it in place of enucleation. It would certainly be permissable to find yet another method which would overcome the difficulty in the treatment of simple chronic glaucoma. We might try, for instance, to make a scar, which at the same time would act as a filter. In this case we would indeed be contending not against the origin of the disease itself, but against its resulting conditions; hence, we would not be retarding the too copious secretion of the intra-ocular fluids. By regulating, however, the outflow of fluid, we generally restore the pressure to a normal equilibrium.

Unfortunately the simple sclerotomy has not given the anticipated results in accomplishing the above. Usually the edges of the wound unite themselves throughout without the formation of a cystoid scar, and the fluid which is secreted in excess does not percolate itself through the wound much better than before. In order to produce a degeneration and permeability of the scar, after making a sclerotomy, we could

allow a piece of cat-gut, or a flap of conjunctiva to remain for some time between the edges of the wound—a method which has already been proposed.

There now remains a problem for surgeons to solve, and that is a method of simple sclerotomy by which there will be produced a permanent cystoid degeneration at the seat of the wound. This scar would then play the rôle of a safety valve, and in this way hinder the intra-ocular pressure from rising above a certain degree.

(1) *Annales d'Oculistique*, 1896.

(2) *Krause*. The neurology of the trigeminus, in reference to the anatomy and physiology of the nerve.

NEWS ITEMS.

Personals and items of interest should be sent to Dr. Frank Allport, 92 State St., Chicago.

A SUIT to recover $40,000 damages for alleged libel, brought by Joseph A. MacKeown, an optician, of 24 East Forty-second street, New York, against Dr. Frank Van Fleet, who, in an address before the Medical Society of the County of New York had spoken of him by implication as a quack, was tried recently in the United States Circuit Court before Judge Wallace and a jury, A verdict was rendered for the defendant.—*Medical Review of Reviews.*

Die Ophthalmologische Klinic, a German edition of the *Clinique Ophtalmologique*, will be published under the editorship of Drs. Konigshofer and Zimmermann, of Stuttgart. It will be an international bi-monthly review of pathology and therapy of eye diseases, and will contain several original articles of clinical interest in each number. The first number was issued November 1, 1897, published by the editors from Stuttgart; price in Germany and Austria, 8 marks (about $2.00), and to foreign countries, 10 marks (about $2.50) a year.

PRIVATDOCENT Dr. Richard Greeff has been appointed Director of the Eye Department of the Charité in Berlin, succeeding Prof. Dr. Burchardt, recently deceased.

FRITHJOF HOLMGREN, professor of physiology in the Upsala University, etc., so well known to the world on account of his theory of color perception and other writings, died August 14, 1897, at the age of 66, in Upsala, of heart failure.

Dr. Theodor Axenfeld, Privatdocent to the Breslau University, and first assistant to the Eye Clinic, has accepted the position of professor of ophthalmology to Rostock. He is known largely on account of his bacteriologic work with Prof. Dr. Uhthoff.

The Western Ophthalmological, Otological, Laryngological and Rhinological Association will meet, as heretofore noticed by The Ophthalmic Record, in Chicago, April, 1898.

It is intended to make the meeting in Chicago an interesting one. The general scheme will be to have a joint morning session the first day, when the necessary addresses and responses will be followed by papers by Drs. H. Knapp, of New York City; J. O. Roe, of Rochester, and G. Sterling Ryerson, of Toronto. In the afternoon separate sessions will be held, one for the eye, and one for the nose, throat and ear. In the evening there will be separate sessions also. On the second day there will be separate morning sessions, with a joint afternoon session, then adjourning so as to leave the evening free for such entertainments as may be arranged by the local Chicago committee. On the afternoon of the second day there will be a time set aside for the presentation of cases, pathological specimens or new instruments. Everything points to a large and enthusiastic meeting.

At the annual meeting of the Chicago Ophthalmological and Otological Society, held January 11, 1898, the following officers were elected: President, Dr. W. Franklin Coleman; Vice-President, Dr. Horace M. Starkey; Secretary, Dr. C. P. Pinckard; Committee on Membership, Drs. F. C. Hotz, W. T. Montgomery, and Wm. H. Wilder.

The American Homœopathic Ophthalmological, Otological and Laryngological Society will hold the next annual meeting in Chicago in June. The officers are: Wm. R. King, M. D., President; Charles H. Helfrich, M. D., Secretary and Treasurer.

For Sale.—De Zeng refractometer 1898 pattern. For information, apply to Dr. B. M. Hanna, 812, Penn Ave., Pittsburg, Pa.

A banquet will be given Tuesday evening, February 8th, by the members of the Chicago Ophthalmological and Otological Society, to Dr. E. L. Holmes, to commemorate his long and valuable services to ophthalmology and to felicitate him on his seventieth birthday.

THE following advertisement, taken from a dental journal, is that of an optical college situated in a prominent Eastern city.

WHY NOT OPTICS?

Is there any reason why the Dentist should not combine the Optical profession? In many of the smaller cities and towns this combination could be made very advantageously; in fact it has been done in many cases and proven very profitable.

"Dentistry and Optometry" is a consistent and suitable coalition, and the one can be cultivated to the mutual advantage of the other. The Dentist who is alive to his own interest can scarcely overlook this promising field.

Our Correspondence Department will furnish the "know how" at small expense and without leaving home.

DEGREES CONFERRED: *Graduate in Optics and Doctor of Refraction.*

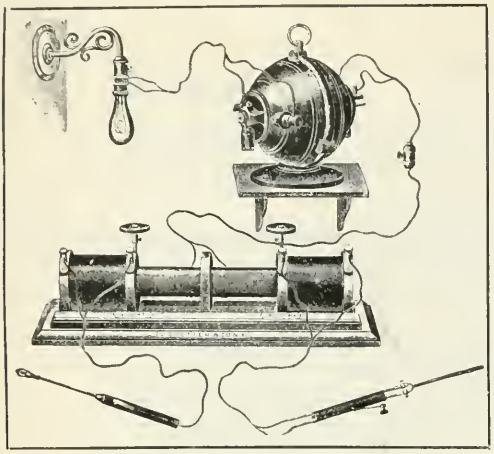
THE mayor of Buffalo, N. Y., who is a physician, has refused to grant licenses to peddlers to sell spectacles on the street. He holds that great injury might result to the eyes of the purchaser from glasses bought in such manner.

WE READ in the *Philadelphia Medical Journal* that every public and parochial school in Boston is subjected to a daily medical inspection. The city is divided into 50 districts for the purpose of medical visitation. Each visitor has from one to five schools to visit. Every teacher in the building is required to report to the master of all the schools there the case of every child who seems to be ailing. The question is, whether the child is ailing sufficiently to be sent home at once. If this is so, the sufferer is dismissed. In no case does the doctor interfere with the practice of the family physician. As to the results of the work, a report for one year says that 8,964 pupils were examined, and 1,156 were found to be too ill to remain in school. Out of this number 382 were eye diseases.

AT A meeting of the *Section on Ophthalmology, College of Physicians*, Philadelphia held in January, Dr. George C. Harlan was elected chairman and Dr. Howard F. Hansell clerk of the section for the ensuing year.

DR. EDWARD JACKSON has been elected President of the *Philadelphia County Medical Society* for 1898.

THE VETTER CAUTERY CONTROLLERS



For the 110 volt Direct Current and for the 52 or 104 volt Alternating Current.

These Controllers have separate coils for cautery knives and diagnostic lamps, and are easily manipulated.

All cautery knives, from the smallest up, may be heated, and every style of diagnostic lamp illuminated.

Can be attached to any electric light fixtures without requiring special wiring.

Send for descriptive circular, and state whether the 110 volt direct or the 52 or 104 alternating current is to be used.

ARTIFICIAL EYES.

Price, first quality, $2.00; second quality, $1.00

We will furnish order blanks for Artificial Eyes, upon request, and are prepared to send a selection to responsible parties.

E. B. Meyrowitz

OPTICIAN

Maker of Ophthalmological, Electro-Medical and X-Ray Apparatus, High grade Eye, Ear, Nose, and Throat Instruments. Unsurpassed facilities for the prompt and accurate execution of Oculists' Prescription Orders. Send for new revised price list of prescription work.

104 East Twenty-third St., NEW YORK.

Annals of Ophthalmology

The largest illustrated Quarterly Eye Journal published. Each issue over 200 pages of original matter and properly drawn up abstracts of recent Domestic and Foreign Ophthalmic Literature.

Subscription price, $4.00 per annum.

Annals of Otology, Rhinology and Laryngology

Each issue over 150 pages original matter and properly drawn abstracts of recent Domestic and Foreign Literature.

Subscription price, $3.00 per annum.

Both Journals, $5

Address **JONES H. PARKER, Publisher, 108 N. 4th St., St. Louis, Mo.**

Wood's Ophthalmic Discs

These Compressed and Gelatine Ophthalmic Discs, prepared by JOHN WYETH & BRO., PHILADELPHIA, after the formula of Dr. Casey A. Wood, are so modified and improved upon as to be most convenient and efficient in the treatment of all affections of the eye. Send for circular and price list to

John Wyeth & Bro., Mfg. Chemists, Philadelphia, Pa.